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ABSTRACT

Specific skill training of the kind usually done on the job (and occasionally by trade schools) is considered in terms of the specific training of people to allow them to function effectively in their occupations. To define the potential role of media in this type of training, a review of major U.S. media-based training programs was conducted. Experiences with media training in three areas are described: managerial and administrative orientation and training; training clerical, sales, and service personnel; and training industrial production personnel. In each area, audience characteristics, choices of media, and implementation considerations are discussed. Appendices describe the uses of media in occupational training programs in such U.S. agencies as American Analysis Corporation, Bank of America, Los Angeles Police Academy, and Stanford School of Medicine. (VT)

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THE USE OF MEDIA IN OCCUPATIONAL TRAINING IN IRAN

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM"

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Chapter I
Introduction

A. THE NEEDS IN OCCUPATIONAL TRAINING

Investments of Iran's oil revenues is causing various sectors of Iran's economy to grow rapidly. To support this growth there needs to be increases in the numbers of persons with certain occupational skills and decreases in others. Iran's education and training programs will have to be increased to supply the necessary skills. This report deals with the possible role of media in increasing the capacity of Iran's training programs in different areas.

Manpower projections have been used to define the areas most in need of increased training programs. These projections were developed from computer-based economic projection models developed by Iran's Plan and Budget Organization and by Stanford University, drawing heavily from the work of the Plan and Budget Organization [1]. Tables I.1 and I.2 present the description of Iran's work force by occupation and by economic sector in 1972 (1351) and projected in 1982 (1361). A number of different projections have been run, both at Stanford and at the Plan and Budget Organization. These runs reflected different growth rates and different emphasis on investment policies. The figures of Table I.2 represent results that are typical as far as the number of people in the major occupational categories are concerned. Comparison runs show that the principle trends in the major occupations are relatively insensitive to the detailed policy decisions. Thus the major manpower training needs and potential training bottlenecks can be found by comparisons of the two tables.

Comparisons show that most categories of semi-skilled or skilled manual labor are growing at about the same rate as the workforce as a whole. The principle exceptions are construction workers and miners and quarrymen, which are projected to grow at two to five times the average rate. The agricultural workforce is expected to show a slight decrease in this decade instead of growing with the population.

Service workers are projected to increase at the rate of the work-force increase and sales workers at a slightly greater rate.

TABLE I.1

OCCUPATION OF EMPLOYED LABOR FORCE BY SECTOR IN 1972

Occupation / Sector	Professional, Technical & Related	Managers & Administrators	Clerical Workers	Sales Workers	Service Workers	Agricultural Workers	Miners & Quarrymen	Transport Equipment Operators & Related	Industrial and Production	TOTAL
Agriculture, Forestry, & Related	494	330	3,856	182	3,986	3,629,563	---	---	15,428	3,653,839
Mining and Manufacturing	17,037	7,391	40,460	28,505	58,626	4,173	9,056	58,672	1,660,916	1,884,836
Oil	3,000	2,000	6,500	1,000	1,000	---	1,000	7,000	28,000	49,500
Construction	10,103	2,106	11,915	1,007	4,298	903	---	21,289	657,985	709,606
Electricity & Utilities	8,185	---	24,595	1,118	11,120	170	---	3,998	31,312	80,498
Commerce, Trade	13,785	709	52,250	670,360	13,345	446	---	31,561	7,392	789,848
Transport, etc.	5,469	3,694	51,882	2,325	17,127	1,203	---	251,523	106,599	439,822
Services	359,519	6,577	283,322	4,693	654,530	44,957	---	30,198	126,291	1,510,087
Activities not Adequately Described	1,492	270	4,174	449	3,244	539	---	---	6,145	16,313
TOTAL	419,084	23,077	478,954	709,639	767,276	3,681,954	10,056	404,241	2,640,068	= 9,134,429

Source: Based on proportions from Iran's Labor Statistics Book: 1972, but totals agree with those in Economic Statistics & Trends of Iran, Sept., 1975, since the latter totals are assumed to be more accurate and were used earlier. (Oil breakdown estimated.)

NOTES: (---) implies low enough to be "not recorded." There is a slight discrepancy in totals; see write up.

TABLE I.2

POSSIBLE SCENARIO FOR THE OCCUPATIONAL DISTRIBUTION
OF WORKERS BY SECTOR: 1982

Occupation / Sector	Professional Technical & Related	Managers & Administrators	Clerical Workers	Sales Workers	Service Workers	Agricultural Workers	Miners & Quarryman	Transport Equipment Operators & Related	Industrial & Production	TOTAL
Agriculture, etc.	33,260	-	-	-	-	3,126,440		33,260	66,520	3,326,000
Manufacturing & Mining	212,240	151,600	363,840	90,960	60,640	[illegible]	60,640	121,280	1,970,800	3,032,000
Construction	77,900	171,380	62,320	-	15,580	-	-	62,320	1,152,920	1,558,000
National Oil & Gas	.240	.160	.520	.80	.80	-	.00	.200	2,640	4,000
Utilities (Water & Power)	7,740	4,300	16,340	860	1,720	-	-	6,020	49,020	86,000
Transport & Communication	14,190	28,380	99,330	4,730	14,190	-	-	193,930	118,250	473,000
Other Services (Commerce, Trade, and Services	502,351	9,804	451,576	908,412	898,752	61,098	-	83,108	179,895	3,095,000
TOTAL	848,221	365,624	993,926	1,005,042	991,262	3,187,538	60,720	500,118	3,540,045	11,492,496

Note: Although this was done for 1982 only, the above could be repeated for each year changing (Table V) coefficients to reflect increasing skill intensity in each occupation.

Source: Table V coefficients times the 1982 Economic Sector totals from Table I (Ref. 1).

The greatest increases in semiskilled white-collar workers are in the clerical occupations. The numbers needed to support the growing economy is expected to more than double in the projection period.

The numbers in professional level occupations are projected to almost triple in the period. The most rapid growth of professionals is among managerial and administrative personnel; these must increase extremely rapidly to supply direction and coordination of the growing economy.

Though the economic projection models do not divide the occupations beyond the nine major categories shown in Tables I.1 and I.2, a good idea of the range of skills represented within each major occupation can be derived from normal labor statistics. Tables I.3, I.4, and I.5 present estimates of numbers of workers in different skills now and with rough estimates in 1992 (1371)[2, pp. I-50 - I-53]. Though actual numbers at this level of detail will vary greatly with specifics of the economic growth, the general trends are representative of the expected future needs. More importantly for manpower training, this breakdown gives a better idea of the large number of skills that will have to be covered by various training programs.

In addition to division by these more detailed skills, there will be finer division of training programs even within a narrow skill category. This is to account for the variation in procedural skills or equipment being used from one employer to another. In considering occupational training, this level of "fractionation" of occupational skills must be accounted for to determine how widely applicable any particular training program will be.

B. FOCUS OF THIS REPORT

Supplying the training implied by Tables I.1 and I.2 will involve all the educational systems of Iran: formal, informal and industrial. This report is concerned only with the specific skill training that is done usually by the employer on the job and occasionally by trade schools fairly directly related to specific job opportunities.

Other components of the education system are considered in other reports. The initial education of people for professional, technical and related positions and for managerial and administrative positions is

TABLE I.5

Projections of Employees in Agriculture, Production, etc.

Detailed Occupation \ Year	Employees (thousands) 1345	1356	1371
Agricultural and Animal Husbandry Wkrs	3119	3550	1809
Forestry Workers	2	3	1
Fisherman, Hunters, Related	16	19	10
Miners, Quarrymen & Mineral Treaters	15	28	45
Well Drillers, Borers and Related	2	5	7
Metal Processers	7	14	22
Wood Preparation Workers & Papermakers	2	2	5
Chemical Processers and Related	9	18	28
Spinners, Weavers, Knitters, & Dyers	592	1133	1777
Tanners, Fellmongers, Pelt Dressers	4	7	11
Food and Beverage Processers	96	184	288
Tobacco Preparers & Product Makers	1	2	3
Tailors, Dressmakers, Sewers, Upholsters	90	172	270
Shoemakers & Leather Goods	54	104	163
Cabinet Makers and Wood Workers	11	21	33
Stone Cutters & Carvers	9	16	26
Blacksmiths, Toolmakers & Machine Tool Operators	42	81	127
Machinery Fitters, Assemblers & Precision Instrumenters	6	11	17
Machine Repairmen and Related	49	93	146
Electrical Fitters and Related	19	36	56
Broadcast Station Operators & Projectionists	0.5	1	2
Plumbers, Welders, Sheet Metal & Structural Metal Erectors	30	55	86

TABLE I.5 (cont'd)

Detailed Occupation \ Year	Employees (thousands) 1345	1356	1371
Jewellery & Precious Metal Workers	5	10	16
Glass Formers, Potters & Related	17	32	50
Rubber & Plastics Product Makers	4	7	11
Printers & Related Workers	6	11	18
Painters	18	34	53
Production & Related Workers N.E.C.	26	50	78
Bricklayers, Carpenters & Const. Workers	204	391	612
Stationary Engines & Related Equip Wkrs	11	129	201
Material Handling & Equip Operators Dock Freight	5	9	13
Transport Equipment Operators	183	349	548
Packers Labelers & Laborers N.E.C.	518	991	1554
Workers Not Classified by Occupation	257	492	772
Total	6,861.4	11,178.6	18,935.1

considered in reports on higher education [3]. The capabilities of the school system to provide primary, guidance cycle, and high school graduates for the job market and functional adult literacy programs are considered in Refs. [4, 5].

This report also does not consider the occupational training needs of the largest single occupational category, agriculture. The training and informational needs of that sector are considered in the separate report on farmer training [6].

This report then is concerned with specific training of people to allow them to function effectively in their occupations. To define the potential role of media to contribute to this training need, a review of

TABLE I.3

Projections of Employees in Professional, Technical, Administrative, and Managerial Occupations

Detailed Occupation / Year	Employees (thousands		
	1345	1356	1371
Physical Scientists and Related Technicians	0.4	1.3	3.4
Architects, Engineers, Related Techs.	13.0	46.0	120.0
Aircraft and Ships' Officers	0.6	2.0	5.0
Life Scientists and Related Techs.	0.5	2.0	5.0
Medical, Dental, Veterinary, Nursing, and Related Technicians	34.0	119.0	308.0
Statisticians, Mathematicians, Systems Analysis, and Related Technicians	0.3	1.0	3.0
Economists	0.1	0.3	0.1
Accountants	8.0	27.0	70.0
Jurists	5.0	17.0	45.0
Teachers	113.0	392.0	(1016.0)*
Workers in Religion	12.0	43.0	112.0
Authors, Journalists, Related Writers	0.8	3.0	8.0
Sculptors, Painters, Photographers, and Related Arts	6.0	20.0	52.0
Composers and Performing Artists	4.0	14.0	37.0
Athletes and Sportsmen, and Related	0.8	3.0	7.0
Other Professional & Technical N.E.C.	4.0	13.0	32.0
Legislative Officials & Government	2.0	8.0	109.0
Managers	10.0	38.0	548.0
Office Supervisors	9.0	35.0	504.0

* The teacher estimate in 1371 is too high.

TABLE I.4

Projections of Employees in Clerical and Related, Sales, Service

Detailed Occupation \ Year	Employees (thousands) 1345	1356	1371
Recording Correspondence & Filing Clerks	98	158	1276
Accounting and Computing Clerks	64	103	825
Stock Clerks and Material and Production Plan	10	17	132
Transport and Communications Supervisors	2	4	31
Transport Conductors	1	2	15
Mail Distribution Clerks	7	11	91
Telephone and Telegraph Operators	9	14	111
Clerical and Related Workers N.E.C.	1	2	15
Working Proprietors (wholesale & retail)	307	535	921
Sales Supervisors and Buyers	3	4	8
Sales Engrs.,Commercial Travelers and Mf. Agt.	0.2	0.4	0.7
Insur., Real Est., Sec. & Bus. Serv., Sales, Auction.	21	37	63
Salesmen, Shop Assts. & Rel	173	303	520
Sales Workers N.E.C.	0.9	2	3
Working Proprietors (Catering & Lodging)	29	65	1153
Housekeeping and Related Serv Workers	196	439	785
Building Care, Charworkers, Cleaners	93	206	370
Launders, Dry Cleaners, Pressers	16	36	64
Hairdressers, Barbers, Beauticians	60	133	238
Undertakers, Embalmers	0.3	0.6	1
Protective Service Workers	82	184	329
Service Workers N.E.C.	35	73	140

major United States media-based training programs was conducted. (See Appendix A for a description of the programs reviewed.) The review covered both "in house" training programs (programs run by the employing institution itself) and media programs produced by contract for other institutions. The programs covered trainees with good educational background and motivation, and trainees with low literacy and poor motivation (e.g., U.S. Army recruits).

The practices in occupational training with media are summarized below and covered in more detail in Chapters II, III, and IV. These practices represent fairly diligent tests of cost-effectiveness. The institutions financially supporting the media programs make use of the employees trained by those media-based lessons. Often the institutions have more conventional training programs available to them and over the years will tend to continue only with those media programs that justify themselves. This is particularly true of the experience and recommendations of the American Analysis Corporation (Appendix B) which has had many years of experience in producing media training programs for a wide range of customers.

The experiences of these institutions of course are not directly applicable to Iran's occupational training programs without the review of the specific circumstances. However, it is felt that the lessons learned by these American institutions are important to planning of a media approach to Iran's occupational training. Where the factors affecting a program in Iran are likely to be significantly different from the American experience, attempts have been made to mention this in the discussion.

It is suggested that the results described in the following chapters together with continued review of manpower training needs projected by the Plan and Budget Organization of Iran should be used as guidelines in planning the introduction of media to occupational training. It is also observed that some of the institutions studied in this review would be a good source of expertise and staff training programs for ERTI.

C. SUMMARY OF RESULTS

The nature of occupational training generally precludes use of broadcast radio or television. There are two reasons for this. First, for effective learning, the person being trained must be able to interact with the media in practicing the skill or procedure. This is not possible with broadcast media. Secondly, the employers generally need the flexibility to begin the training program at their convenience, not at the convenience of some national or regional broadcast schedule.

Where media is used in occupational training, a variety of choices are available. Audio cassettes and workbooks are the least expensive to produce and use. Video cassette with simple lecture format programs typically are the next in line in costs. Well prepared slide and audio tape presentations are more expensive than video lectures to produce, but less expensive to duplicate and play back at the learning site. Complex video production is most expensive. Video is sometimes mixed with film for convenience in complex production but then transferred to video cassette for distribution and use at the training site.

The choice of media depends heavily on the particular application; all of the above combinations are found in successful programs. The choice also depends to a large degree on past investment in equipment. This is particularly true in applications that could use either slide-tape or video cassettes. Where a number of applications in an institution have warranted use of video cassettes (e.g., video lecture applications), then other applications that would be equally effective with either slide-tape or video will choose video to get more use out of the video equipment.

In the great majority of the occupational training applications, the training takes place in the employer's institution rather than in an outside school. This occurs because (1) many of the procedural skills or machine operations being taught are specific to the individual employer; (2) the equipment to be used on the job and in the training program is available; (3) the training is more effective if the learner can interact with the actual work situation; and (4) even with media, a person skilled in the procedure must interact with the learner. Such a person is more easily available in the employing institution. The exceptions in the cases studied were in the learning of some of the basic skills in accounting and typing.

The experiences with media training in the three areas, (1) managerial occupations; (2) clerical, sales, and service occupations; and (3) industrial occupations are discussed below.

1. Managerial

At the management and administrative positions, the educational level is generally high. In comparison with more junior positions, the motivation is typically higher due to the relationship between improved performance and promotion in position or salary.

The principle use of media at the managerial and administrative level is in transmitting executive messages from the central management to the managers of offices located in other cities. Video cassette recordings, usually a simple talk by the senior executives, convey latest policy positions, project directions, etc., to branch managers.

This technique is in regular use by a number of national corporations with many branch offices. The video cassettes reduce the need for the institution's top executives to travel to branch offices, provide more direct policy guidance to lower level adminstrators that otherwise would never see top management, and provide more rapid institutional response to program changes.

The same video systems are also used to record managerial conferences for distribution to branch management.

In both these applications, simple video production is used to keep the messages straightforward and provide quick transmission of the information to the managerial staff.

There is some use of more complex video production and film in programs intended primarily to provide institutional orientation to new managers. In such uses, the history and mission of the organization is described with more polished production. There was also use of polished productions to bring managers up to date on new products, etc. These were often information releases produced by other organizations.

A final application was use of media to focus decision-making in top level conferences.

2. Clerical, Sales, and Service

In these areas, the trainees' educational level and motivation are generally lower than at the managerial level. Where the motivation

is moderate and the training was information (as opposed to procedural skills), video cassettes of simple lecture formats were effective. Examples of such occupations included training of policemen and high level sales forces.

Most training applications in these areas, however, involve procedural skills, such as computation, form completion, filing, typing, and operating simple machines. The media training for such skills is most effective when it is used to closely simulate and guide the trainee through the procedure. Audio cassettes were effective in teaching typing skills and basic accounting procedures. Slide-tape is effective in teaching filing procedures, operating of machines, filling in of forms, etc.

The media for these applications must be carefully designed to concentrate on the skill being taught and avoid extraneous information or distracting visual content. The forms or equipment to be used, or models of them, should be available to the trainee to use interactively with the media lesson. In so far as possible, the media lesson should parallel the actual job itself, allowing the trainee to practice the skill.

The media lessons still require personnel to teach the trainees. But with the media the trainers can be fewer and, typically, they can be another employee skilled in the procedure being taught instead of a more highly trained instructor.

There are many skills, particularly in the sales and service occupations, where the procedures are simple and can be best taught by normal on-the-job training by a supervisor without any media. In such semi-skilled positions the use of media might even make the job more difficult than it actually is.

3. Industrial

Many of the guidelines for teaching of procedural skills to clerical employees apply as well to industrial employees. The media lessons should be designed to very closely simulate the actual job, and reduce the distance between training experience and job experience. The actual equipment to be used, or models of it, should be part of the lessons.

The main differences between clerical and industrial employees in general is lower motivation and a low level of literacy. The media lessons for the industrial employees therefore must rely more on the

visual and audio messages and avoid written explanations as much as is possible.

Instructional personnel is needed, as before, to guide the trainee through the learning process. But the media allows the trainer to be another employee skilled in the procedure instead of a more highly trained instructor.

The benefit in using media in these applications is in savings in numbers of instructors needed and more uniformity in training results.

The experiences of the institutions using media in occupational training and the procedures they have developed to produce effective training programs are described in the following chapters and appendices.

Chapter II

Use of Media in Managerial and Administrative Orientation and Training

A. INTRODUCTION

This section applies to Iran's needs for in-service orientation and training of managerial and administrative personnel. The applications considered in the section are for persons who have achieved managerial and administrative positions in their careers and need training and direction in their specific responsibilities. (The initial education or general upgrading of the professional is considered in other reports on higher education and teacher training.)

The cases studied included mainly business and industrial organizations and thus are specifically relevant to such institutions. However, a governmental agency, the Police Academy, and an organization, American Telephone and Telegraph, whose equivalent is governmental in Iran, were included. It is felt that the cases studied are generally applicable also to governmental administration and management training and orientation.

The discussion of media in training of personnel at the managerial-administrative levels is presented in three parts.

(i) The Audience Characteristics
(ii) Choices of Media
(iii) Implementation Considerations.

B. AUDIENCE CHARACTERISTICS

The managerial and administrative audience considered in this chapter is generally college educated and well accustomed to television. Motivation for self-improvement is generally high, especially if improvement brings advancement within the institution. Absorbing and acting on job related information often results also in monetary rewards.

Essentially, managers and administrators form a captive audience. Where motivation runs high, elaborate video production is not necessary. The audience closely parallels advance college students where simple television production techniques have been shown to be effective.

In fact, where absorption of the information is more directly related to career and monetary advancement, the audience might be expected to be even more receptive to simple video messages.

C. CHOICE OF MEDIA

The general uses of media in business and industrial management, supervision and administration fall into two major categories:

- Video recording of executive messages and managerial conferences
- Multi-media approaches to managerial training and orientation.

1. Video Recording of Executive Messages

At the managerial level the larger companies like Bank of America and Hewlett Packard use video recordings to communicate important messages and general policy decisions within the company. For most companies this means low-cost video recording of upper management reading speeches to the camera. After minor editing, the recordings are duplicated and distributed to the company's branches throughout the country by mail or commercial delivery service.

Only one company studied, American Telephone and Telegraph (AT&T), distributes these executive messages electronically. They are able to do this through their easy access to the national microwave communications network. (NIRT may be in a similar position to use back-up television channels in the national network and eventually in the satellite for national distribution of executive messages.)

The majority of the applications, however, use the video cassettes for distribution because of their lower costs and greater flexibility. The Police Academy in Los Angeles, for example, records the messages in its own television studio and mails the cassettes to its 17 regional districts in Los Angeles. This allows managers in each district to view the tape at their own convenience. For the district, this enables coordinating the schedules of numerous employees for a large group viewing session or individual viewing by employees to suit their own time availability.

In local distribution, companies could consider use of in-house cable television systems to communicate executive messages within their

building. However, none of the companies studied maintained a closed circuit facility. For most companies, the limited amount of media production does not merit numerous viewing monitors. When upper management does communicate with video, one large viewing room accommodates a group audience or a smaller facility is used for individual screening.

It is important to note that printed material and the telephone continue to be the primary media for conveying executive messages and results of managerial conferences. Visual media use is a recent innovation but promises to become more common.

2. Video Recording of Managerial Conferences

Another use of video tape recording is the taping of managerial conferences. AT&T in particular, uses this practice to keep its widely dispersed personnel up to date on the most recent policy controversies. In this way, conferences held in New York can be viewed by San Francisco. Once again, AT&T, (and possibly NIRT), can distribute such conferences live to cities throughout the nation.

It is more common, however, even for AT&T to record the conferences and mail video tapes. This allows an intermediate editing of irrelevant material and at the local offices it allows screening of the conferences at a time convenient to the local staff.

3. Multi-Media Approaches to Managerial Training and Orientation

At the present time, there is little difference between communicating executive messages and conferences with video and the use of video for managerial training and orientation. Ironically, the content of managerial training programs is basically executive messages and conferences.

For example, 80% of Bank of America's video programming communicates upper management messages to aspiring managers and administrative personnel. This is also true for AT&T and Hewlett Packard's managerial training with video. However, Bank of America and Hewlett Packard are now beginning to produce more elaborate programs.

According to the audio-visual director at Bank of America and others, the main reasons why video programming has been relegated to "head and shoulders speeches" from upper management are:

(i) The production costs are lower than more elaborate programming. For example, a 30 minute "talking head" program costs roughly 5% of a program involving extensive production.

(ii) The necessary immediacy of the message. When the company president puts on his best tie to sit in front of the camera, he expects his audience to view the tape within days, and in AT&T's case within hours, of his presentation. More complex production does not offer this immediacy.

(iii) The demand for more elaborate production is only beginning to arise. This is an important feature for any agency considering supporting personnel training with media.

Simpler production costs and immediacy will continue to call ple video production techniques for executive messages and mana- conferences. However, in managerial training and other personnel applications, more complex production techniques are expected .

As mentioned earlier, the main form of in-house business commu- s continues to be telephone and printed materials. But in rial training, the dominant teaching modes are lecture, demonstra- discussion and role playing. Interdepartmental communications rsonnel training traditionally operate largely without the new .

As the Bank of America media director explains, old timers do ge overnight. Many of them are intimidated by fancy equipment, bout being replaced by it, or are not aware of the possibilities n provide. He emphasizes the need for educating personnel tors to the potentials of the new media and even more importantly ing them that media will not replace them but rather will help a better job with greater ease. If audio visual departments carry on this public relations campaign there will not be a for their services.

Bank of America predicts that within two years, most of their nt training will convert to include video and most of the mana- training programming will convert from the "talking heads" to phisticated productions, obviously, upper management concurs. America has a $4,000,000 production facility with roughly 20

full-time instructional technologists and production personnel. The main hurdle according to their director is to educate department heads and instructors to the new media and create a stronger demand for production.

Currently, there are some areas in which more elaborate production is used to a small degree. These include company (or institution) history and orientation, motivation and responsibilities (used both by Hewlett Packard and Bank of America) and managerial skills. The Bank of America for example (Appendix C) includes production of a number of programs in their library for management orientation and training.

Companies, particularly those in technical areas, also use video productions (often prepared by other manufacturers) to appraise management of new products or developments. Syntex, for example, makes use of commercial tapes to keep their sales managers up to date on recent ideas in the biological sciences. They purchase the tapes for upwards of $250 each or lease them for much less and then circulate them by mail to their many branch offices. Bank of America and Hewlett Packard also use video to up date managers on technical information.

In managerial training, in addition to video tape, there is some use of other media forms such as film and still to some degree slide-tape presentations although not they are not used extensively Video is the most widely used medium of training.

Personnel instructors, when media is used, favor video for its convenience and cost. It is relatively easy to have the instructor's "normal lectures" video taped and then shown to a new audience. The video recording format more readily draws from their normal lecture materials. Once the cameras and playback monitors are available, video production is less costly; it is more immediately available and involves less time consuming production. For the instructors, video cassettes are easily managed in classes, well adapted to storing, more durable and inevitably reusable when the content becomes obsolete.

In the companies studied, for managerial training, video has replaced slide-tape operations completely. This is partly because the commitment the companies have made to the video production facilities.

Another factor is the belief that television has become a second language in American culture, not slide-tapes. (The familiarity of Iranian administrators and managers with television might also be a factor in the choice of video over other media.)

In any case, the cost and convenience of video recording and cassette distribution make this medium the preferred choice for managerial training. It is only in special circumstances that other media are used. 16mm or 35mm film is used when filming locations and situations are not suited to the more bulky video equipment. In these cases, the distribution is still often done by video cassette instead of film reel.

4. Media Support of Major Executive Conferences

There is one special use of media at the managerial level that calls for special attention. This application is directed inward towards central management rather than outward towards dispersed management.

The application is the use of multi-media to support top level decision making. At AT&T a team of video producers, graphic artists, and writers convene before major managerial conferences. They prepare multi-media campaigns to funnel discussion to the issues of the conference. Video presentations, posters, printed materials, and even match boxes are designed to direct managers to the problems at hand. Video dramatizations, poster slogans, and cartoons help isolate the conference objectives and induce higher quality decision making.

It is possible that this process may be useful to help support governmental decision conferences.

D. IMPLEMENTATION CONSIDERATIONS

The advantages of using video cassettes in communicating executive messages and managerial conferences are as follows:

(i) The video cassette literally substitutes for the presence of the top executive in the branch offices of an institution. It enables utilization and sharing of executives' personal resources throughout the institution.

(ii) The media facilitates closer ties among upper and lower management spread out over a broad geographical area. When face-to-face contact is unnecessary or problematic due to logistics, an executive message presented in video form is second best to the personal touch.

Example: Hewlett Packard recently forwarded a video cassette of the address from their Vice President in California to a conference in Geneva. They send similar communiques to branch offices in 41 countries around the world.

(iii) The cost of mailing video cassettes within a state or country, or even internationally, in many applications is much less than the costs of taking the organization's valuable executives from their central offices and sending them on the same tour.

The cost factors will vary with the applications. On the video side of the costs, the factors to be included are:

° Production of the illustrated lecture

- Pre-planning, script writers
- Use of executive's time
- Use of studio and equipment; cameras, mixers, editors
- Use of camera crew
- Use of editors and graphic artists

° Duplication

- Cassettes (reusable)
- Duplicating equipment
- Staff

° Distribution

- Packaging
- Mailing for delivery service

Hewlett Packard in their operation encounter approximately the following costs for an executive message with a simple format:

° $1000 for production of the message

° $2500 for duplication of 100 video cassettes

° $500 for distribution to 100 branch offices

This comes to approximately $40 per executive message to each of 100 branch offices. In comparison is the cost of the executive traveling personally to each branch office. The cost will, of course, vary with the application, but for an institution with branch offices throughout Iran, the cost of top executives traveling to those offices will far exceed the cost of sending video cassettes.

(iv) Video tape communication with branch offices (or even within the central offices) can clarify executive policy, bring managers up to date on problems, and motivate action.

(v) The video taped message provides the managers with a uniform message and avoids second and third hand distortions of upper management policy.

(vi) In group sessions reviewing the recorded program; the absence of upper management stimulates more open discussion and facilitates unintimidated problem solving.

(vii) Video communication also alleviates upper management's task of repeating the same messages to numerous departments or branches. For example, Bank of America uses video to communicate with 1,100 branch offices. On the same day or week each branch manager can receive a relatively personal message from an executive he might normally never meet.

(viii) In playing the tape, the branch managers or department heads can view the tape at their own convenience. They can rewind and review the tape, view it individually or in groups and as many times as they wish to.

(ix) If any problems or questions arise from the video message, viewers can respond by telephone or by inter-office mail.

(x) The same merits of video messaging apply to the merits of video conferencing. Here the costs of the non-video conference would involve supporting the branch managers to come to a central conference location rather than sending executives to branch offices.

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The use of video cassettes for executive messages and conferences do have the following limitations.

(i) The Bank of America (obviously having success with the executive messages) reports that the only problem with the communication system is that personnel are overly enthusiastic. Anytime a tape arrives at a branch office, everyone leaves whatever they are doing to view the next episode from the head office.

(ii) The capital cost and maintenance of the playback equipment must be accounted for. In the United States the playback monitor and color viewer costs about $2000. Bank of America maintains a full time technician and spare parts for every 10 branches. The number of sets in each branch of an institution and the frequency of use of each set will determine the typical cost related to the playback equipment. Annualized initial cost and annual maintenance will be about $500 per

playback facilty per year. The frequency of use in a year might run from once a week to ten or twenty times a week depending on the number of video applications in the institution's programs. This adds from $10 per play to the message and tape costs at the low-use extreme or less than $1 per play if the equipment is extensively used.

(iii) One of the drawbacks the author sees in the video message system is that it is explicitly one-way. It does not facilitate a sharing of information between the parties. In the Bank of America case, the opportunity for telephone response is available but seldom links the original sender with the listener. To combat this one-way system, especially where telephone communication may be inadequate, portable video recording might be used. By taping problems and raising questions at the local level, lower level managers could raise new issues and facilitate upper management policy decisions.

Chapter III

Use of Media in Training Clerical, Sales, and Service Personnel

A. INTRODUCTION

This section deals generally with the role of media in skill training for clerical, sales, and service occupations. These occupations represent a major area of growth in Iran's manpower projections, especially the clerical occupations. The results presented below are drawn from specific applications in media training for the following skills:

Accounting and Computing
Typing and Filing
Real Estate Sales
Bank Tellers
Electronic Equipment Sales
Electronic Equipment Servicing
Pharmaceutical Sales
Protective Services
Military Training

Although these skills only sample the many skills needed by Iran in clerical, sales, and service occupations, they cover a sufficiently broad spectrum that general guidelines on effectiveness and media selection can be drawn. The jobs considered represent a mix of conceptual and manual skills and a variety of worker's background and motivation. In some cases, media is an effective means to train, in others it is ineffective. For the areas in which media is useful, it is particularly important to select the best mix of media, slide-tape, programmed text, film, etc. and not just to rely on one form, like video.

Applications of media in training of telephone and telegraph operators, hairdressers, barbers, and beauticians, and transport and communications supervisors are expected to show similar potential to the examples considered in this and the following chapter.

There are many other skills included in the list of occupations for Iran. However, it is felt that specific skill training in most of these areas are not conducive to the use of media. The semiskilled nature of the jobs, the diversity of the applications, and the specificity of each job to

a particular situation suggests that normal on-the-job training would be more effective than introduction of media instruction. For example, building care, charworkers, cleaners, transport conductors, mail clerks, etc.; to train these skills with media appears too costly in comparison to the minimal on the job learning time that would be required to reach competency. The U.S. Army training division, even with large numbers of semiskilled jobs, has found that training of personnel for these simpler skills with media is not only cost-ineffective, but it can also make a simple skill more difficult to learn than it really is.

The following sections discuss the use of media in the more skilled areas of clerical, sales, and service occupations. First, the general audience characteristics are described, leading to some guidelines for media selection, then examples of alternate uses of media in these occupations are reviewed, and finally, general guidelines are developed for production distribution and implementation of effective media training programs for this set of skills.

B. AUDIENCE CHARACTERISTICS

At the semiskilled level, including clerical and service workers, the audience studied generally had a high school education with some technical training beyond high school. A minority attended two years of city junior colleges and a majority trained for one or two years at business or technical schools before taking jobs.

Motivation for self-improvement was generally dramatically lower than motivation found on the managerial or administrative levels. For many of the trainees interviewed, the job was simply a necessity and they did not foresee much advancement beyond what they were doing. As a media audience, their curiosity was high but their motivation for learning was not.

These audience characteristics lead to some general guidelines for media use. An informal survey of the media trainees indicated that use of media for clerical and service workers is more effective under the following conditions:

(i) When monetary rewards motivate the trainee.

(ii) When attaining a new job compels the trainee to acquire new skills.

(iii) When a media program deals specifically with a worker's problem and teaches him a solution to that problem.

(iv) When the media program simulates the job environment of the trainee. For example, a bank teller learning a new skill prefers to learn from a media dramatization of another bank teller performing that skill, not from a video lecture of a supervisor.

(v) When the media producers can instill motivation in the trainees through a positive portrayal of the job and the importance of the individual to the larger company or institution.

(vi) When the quality of the program maintains the trainee's attention.

In short, the use of media for training of these skill levels must overcome serious barriers of motivation of the trainees. Motivation of the job situation, relating advancement to skills, and media design, are both important in selecting and implementing a media-based training program.

The importance of motivation was illustrated in the selection of media for the training of real estate and business sales representatives. In this group, the educational levels were higher and the sales skills being taught are closely related to job advancement and personal income. Because of this high motivation, the Anthony School of Real Estate, the agency studied, predominately used the video lecture mode, "talking head," with good effectiveness. There are expected to be similar areas in Iran, particularly in the business sector where such motivation would allow use of simple video production techniques for training of sales personnel.

For the training of shop sales personnel and assistants, the motivation typically is not nearly as great. In most cases, it is felt by the researcher, that these occupations would be best trained on the job using normal techniques. The combination of relatively low skill levels required, the diversity of the specific skills from one business to another, and the typically low motivation do not appear conducive to media training. Media can effectively train in the computational skills but the nature of the money transactions of a typical shop are more efficiently trained on the job.

It is possible that general education in basic mathematical skills and literacy in Iran would benefit this group of occupations, particularly in areas affected by limitations of the elementary and guidance cycle schools. However, to relate such courses to specific occupational training with media for sales and clerical workers would not seem to be warranted for the reasons stated above.

The trainees for the protective services category that was studied consisted of the Los Angeles Police Academy. These trainees required a high school education and a reading proficiency of at least 8th grade on the Fry Reading School Scale. Their motivation levels largely depended on their desire for public service and the anticipation of consistent remuneration as a policeman. At the course level in the Academy, the recruits had to pass examinations to graduate. Thus, written tests and anticipation of qualifying for the job motivated recruits to attend the media training. Due to this motivation and the informational nature of the material being taught, the video lecture format was generally adequate. Yet, some elaborate production of "on location" video generated better results especially as a stimulation to discussion.

C. CHOICES OF MEDIA

Where motivation was sufficient to warrant the use of media in occupational training, the range of media choice was wide. In some cases, the choice of media was heavily influenced by past investment in equipment; institutions with a large video facility had replaced simpler media forms with the video cassettes, ignoring cost factors. But, generally, there were requirements of media selection and use that were determined by the type of skill being taught.

The experiences in the different media applications are summarized below.

1. Video vs. Slide-tape

Many of the institutions studied, as mentioned above, have converted their media training from slide-tape (film slides and audio cassette) formats to exclusively video tape. However, that is not to say that slide-tape is not effective. In fact, the slide-tape format is less expensive in most applications and it is better adapted to the teaching of many

procedural skills than is video [illegible]. A major reason for the change-over to video for these skills is the million-dollar investment made by the companies in the video equipment. While the video investments were warranted for many of the applications, their use for teaching of procedural skills were justified mainly on the basis of unused capacity, not on the basis of effectiveness of basic costs.

For smaller institutions or for organizations who have not already invested in video equipment, slide-tape can be an effective teaching tool. Its merit lies in teaching of a step by step procedure, where each step can be simplified in a still photograph or drawing. For example, skills like filling in forms, office filing, hair cutting, and servicing equipment are well suited to slide tape instruction.

If the slide-tape program is accompanied with copies of the forms that need explanation or the equipment that needs servicing, instruction is even more successful.

The U.S. Army has adopted a modification of slide-tape systems for training everything from clerical skills to operating complex computerized equipment. The Bessler machine that projects their programs utilizes the best features from slide tape and 8mm film to produce both frame by frame procedure or live action in the same presentation. The lessons are programmed by an audio cassette. The pace of the program is adapted to the individual learner, following extensive testing of the lessons with sample students. As with slide-tape, if the lessons are combined with the forms, equipment or models of the equipment, then instruction is extremely effective.

Even less expensive than slide tape or the Bessler machine and just as successful in many training applications is the much overlooked "film strip." With a simple projector and a knowledgeable narrator, a film strip lesson is perfectly adequate. For many applications, these "small" media can be just as effective as big media. Big media, like video production, does not always mean better results.

Slide-tape, audio-cassette (and video) are more effective when interrelated with printed materials and student participation. The trainee learns a procedural skill more efficiently if he can intersperse viewing the media with practicing the skill being taught. (For procedural skill training, this leaves out television broadcast and even video cassette

viewing in large groups.) Also, if the student cannot attend to the media while on the job or with use of forms, equipment, or models related to the job, then paper and pencil responses are required. Student worksheets afford a student a chance to actively participate in his own learning. Every company in this study combines media with both printed materials and student worksheets to practice and test application of lesson content. American Analysis president, Dr. Peter Linn, believes that telling is not teaching. To increase learning of skills from media, he believes that the learner must respond to each concept or step in a procedure. Otherwise, there is no indication that the media is making any effect.

2. Use of Audio Cassette

To teach some accounting skills, computational skills, typing and other related clerical skills, training with audio cassette is not only adequate, but preferred, by the trainees in this study. In comparison to slide-tape presentations, students stated that the addition of visuals was superfluous. Students in a junior college typing class complained that having a look at a "pretty picture" had little to do with typing and only wasted their time. They did appreciate the guidance offered by audio cassettes and programmed booklets. The audio cassettes and booklets simply lead the students through practical expercises on the typewriter. Of course, the main component of learning to type is practice on the typewriter. Slide-tape or video programs are unnecessary.

Similar comments come from students in a junior college accounting class. Yet companies with video facilities, like Bank of America, claim equal success in teaching business acounting practices with video cassette.* The Bank of America, however, agrees that learning computational procedural

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* Where motion is not required, slide tape and video cassettes are very similar as far as the student is concerned. (The video producer can always avoid distracting visuals and make the program as simple as a slide tape lesson.) For such applications, video production and slide tape production are close in cost, the real cost to the institution depending more on past investment than on any other factor. The main difference in cost comes in the reproduction and playback facilities which are currently more expensive for the video cassette. In many applications, these learning site costs will weight the decision toward the choice of slide tape when motion is not important. When audio cassette without film strip is adequate, as in the accounting course, the costs of both production and playback are heavily in favor of the audio cassette.

3. Use of Video

In the above sections, it was observed that in may areas of occupational training, particularly where skills are being taught, the use of video cassettes is not warranted by considerations of cost-effectiveness. There are applications, however, where the purpose of the training is to convey information rather than procedural skills. Here the use of video has been found to be effective (even less costly when simple production is used) and the institutions studied have used it extensively. In the previous chapter, the use of video in managerial direction and training was discussed. In section B of this chapter the use of video by the Los Angeles Police Academy was described, as was the use of video in training of sales representatives.

Where the training warrants the use of video, the decision must still be made as to the quality and cost of the video production techniques that should be used. The main choice is between (1) the relatively inexpensive lecture-demonstration, and (2) elaborate studio production. In choosing one mode over another, the following criteria should be considered.

(i) Budgetary and time constraints: the lecture-demonstration mode costs much less and production takes only as long as the lecture itself.

(ii) The audience: For an audience motivated by credentialing requirements, career or pay advancement, the lecture-demonstration mode will suffice. This audience includes managers, administrators, real estate and commercial sales persons, professionals, etc. For less highly motivated students and personnel, more entertaining and sophisticated production increases learning and can justify the higher cost. Of course, the former group enjoys elaborate programming also, but if budgetary constraints or time preclude expensive production, they can be sacrificed.

(iii) The purposes of the program: Companies producing public relations programs, motivational programs, company histories, and general employee orientation use elaborate production. Whereas for a real estate course a video lecture will suffice.

4. Video Playback

A special use of video not mentioned above is the use of video playback. In this application, the trainee is recorded on video tape as he practices some skill and then review his own performance. This application is used in the training of sales representatives.

In sales training, companies record mock sales interviews and then play them back for the trainee. By viewing himself in the interview, the trainee can adjust his approach. Syntex, a large pharmaceutical company, believes that their salesmen learn more from this self-viewing than any other training technique. During orientation, each salesman keeps the video of his most recent mock interview and plays it numerous times. At sales conferences, Syntex installs a playback system in the nearby hotels for salesment to study their techniques after business hours.

D. IMPLEMENTATION CONSIDERATIONS

A number of guidelines for production of media-based training in clerical, sales, and service skills can be drawn from the cases studied. These are discussed below, first in terms of factors related generally to media-based skill training, and then in terms of applications of specific media types.

1. General Use of Media in Skill Training

The goals of training people in clerical, sales, and service skills are much more specific than education of people in the professions or at the managerial level. The skill training is usually intended to make the trainee proficient in a few well defined procedures, be they computational procedures, filling forms, or operating machines. To be effective in such procedural skill training, the media must match the learning process to the skill application. It must also account for the importance of human interaction in the learning process.

a. Matching Learning Process to Skill Application

A successful performance in a lesson may not guarantee that the learner will be able to perform the desired skill. This may seem paradoxical, but it is a finding of reasearch conducted by American Analysis.

Ideal instruction occurs in a one-to-one relationship between instructor and student where the learning environment is identical to the environment where the student must eventually perform the skill. For example, an ideal situation for learning business accounting occurs when a competent accountant works with a trainee on an actual business problem in an office.

It is when this ideal teaching situation is not possible that off-the-job training and the use of media is considered. However, media instruction, to be effective, must simulate this ideal situation as closely as possible. If a media lesson is to effectively teach accounting, for example, it must:

(i) act as a tutor;

(ii) provide actual business problems;

(iii) allow the student to practice solving problems;

(iv) isolate potential difficulties;

(v) show solutions so the student can check his work;

(vi) reinforce correct answers; and

(vii) provide remedial exercises when required.

The emphasis throughout the lesson should be on getting the student actively involved in problems he will face on the job. For pencil and paper occupations, media can fulfill these criteria in a straightforward way. For teaching not related to paper and pencil skills, e.g., operating business machines, the job is more difficult.

Ideally, when operation of a machine is being taught, the machine should accompany the media lesson and the media lesson should guide the learner through the operating procedure. But, it is not always possible to supply each student with an expensive piece of equipment. The next best thing is a model of the equipment. For example, in teaching students how to operate a computer, Bell Telephone accompanies their media lesson with a cardboard model of a computer. By watching the lesson and manipulating the model, the learner simulates the job performance. Thus the "distance" between the lesson and the job is less than it would be without the model. The media producer should always aim at decreasing the "distance" (or difference) between the learning experience and the actual job environment.

The problem of a good lesson and a bad job performance comes when the distance between the lesson and the job is so great that the student can not make the leap. For example, a media lesson designed to teach typing cannot rely on the student answering paper and pencil questions. Although the student may be actively responding, he may never learn to type.

Solutions to this problem are complex. It may appear that media cannot train an office worker or a service technician how to operate or repair machinery unless the machinery is available. But this is not true. Media can very definitely train students to operate equipment. But to be effective, the right media must be selected and the lesson must be well matched to the student.

For every skill and audience, there is a specific medium or mix of media that is most effective. An analyst must weigh the complexity of the skill, the entry level of the audience, the availability of equipment and/or models, the media production and viewing equipment available, and budget constraints. From these factors, a best media mix can be selected.

A simple skill like filing procedures is more efficiently taught with the simplest media, a poster or a cue card, or a list of instructions. A programmed text and a typewriter will suffice for typing. An audio cassette, combined with worksheets, will effectively train accounting and computational skills.

To teach skills where the visual factor is an essential component, as in operating and servicing equipment, the media lesson must also be geared closely to the student. For example, American Analysis first designs a rough copy of a lesson, tries it on students, then redesigns it. Each time a student takes the lesson he attempts the skill immediately afterward. The students point out confusing visuals or script, unclear teaching methods, and even procedural errors in the content. This validation process ensures that the lesson will inevitably enable the student to both understand the reasoning and general concepts behind a skill and to perform the skill in a job situation.

American Analysis has discovered that audio visual lessons, if they are tailored to the student performance, will enable the student to competently perform the job. Practice, of course, will perfect the skill. They find that their media lessons replace the need of a highly trained and highly paid instructor. The trainees are able to take the media lessons and then join a less costly "inventor" to practice the skill.

b. Human Interaction in the Learning Process

When a media approach is used in skill training, there is a danger of discounting the elusive human factors important to teaching

and learning. The president of American Analysis contends that media producers must continually remind themselves of the human process they are attempting to replace. "No matter how elaborate the media production is," he claims, "an emotional block in the student can prevent the learning process from taking place." For example, a student who is intimidated by mathematics may not learn from countless media lessons on accounting. Or an office worker who is reluctant to operate a business machine will not overcome that emotional block simply due to a polished video program.

The essential agent in overcoming emotional blocks to learning is another human being. Human understanding occurs ultimately between two people. Dr. Lenn, of American Analysis, is not alone in this conclusion; the literature is replete with similar statements. But, coming from the man who heads one of the largest educational media producers in the United States, his comment takes on more weight. Despite the widespread use of his self-study programs he stresses the need for a "mentor" and for regular interaction between mentor and learner.

The mentor need not be a highly skilled instructor; the media will already reflect the teaching skill of experts in the content area. But the mentors must themselves be able to perform the skill being taught and interact on a personal basis with the students.

This attitude was also reflected in other of the cases studied. The Director of Audio-Visual Development for Hewlett Packard asserted that media was only a complement to the human interactions within the company. He emphasized that training results were far better with an on-site tutor or discussion leader. At Skyline College the producer of the audio course in accounting also reflected this attitude when he said, "The students like the course only if they like the instructor. If they don't like the instructor, they don't like the course and don't do as well."

In planning the use of media in skill training, the role of the mentor must be carefully accounted for. The media may carry the main responsibility for organizing and systematically presenting the information to be learned. In this way, the media can eliminate the need for a highly trained instructor. However, provision must still be made for a person who is skilled in the procedure being taught to interact with the student.

For any particular application, the benefit of media use will come from the elimination of the need for a highly skilled instructor.

He can be replaced with a much less skilled "mentor" who spends less time with the student than the trained instructor would have spent.

In addition, the use of media allows more independent and remedial study by the students. And the use of the common media lessons provide the learners with more uniform content.

Whether these savings overcome the costs of developing and using the media will depend on the specific application. The selection of media, its costs, the number of trainees, and the degree to which the media reduces the need for instructors will vary greatly from subject to subject. It is expected that in Iran, particularly in clerical skill training, there will be many beneficial uses for media. With the great demand for clerical skills to support the economic growth and the shortages in instructors, media should find important applications.

c. Content Definition, Stability and Revisions

The highest hidden costs of media production reported by American Analysis was incurred not by them, but by their clients. Since the "client" institution provides the subject matter experts and hence define the content of the lessons, that organization controls the production. Changes in content, revisions, additions, and the bureaucratic process in general usually cost more than the production of the lesson itself once its purpose is defined. And if, in addition, the job procedures are changed in a year or two, then the whole process must be repeated and all lesson materials in the field replaced with the revised versions.

In the case of the U.S. Army, the bureaucratic costs are very high. However, the size of the audience offsets these expenses; the Army reproduced 2,500 to 3,000 copies of each lesson and distributes them to training centers throughout the world. (In fact, Iran purchases a number of the lessons and translates them into Farsi.)

It is expected that in Iran there will be an equally important cost related to the initial definition of the content and subsequent revisions of the training courses. In most cases the skills are not easily generalized, but must be matched to one institution and its practices. An important consideration in developing occupational training media programs is the selection of that "client" institution. The institution should be

large enough so the number of trainees for each lesson warrants the planning costs and media production costs. Skills with relatively stable content should be selected to minimize the need for revision of the media materials, due to changed job procedures, introduction of new machinery, etc.

In the case of Educational Radio and Television of Iran initial projects, if possible, should be selected so that material produced for one institution would be adaptable by others in the country. While this is difficult in many skill categories, there are areas particularly in the clerical occupations where skills would be common to a large number of different institutions.

2. Use of Slide-Tape

a. Costs

Typical costs of slide-tape production can be drawn from the experience of the American Analysis Corporation, a leading producer for the U.S. Army. The actual costs will depend on the application, but the following costs are typical for a thirty-minute lesson:

Initial Analysis	$500
Script Writing	$500
Validating and Testing	$500
Staff Travel	$500
Story Board Art	$1,000
Final Art	$3,000
Filming of Final Art	$500
Miscellaneous & Revisions	$1,000
TOTAL	$7,500

These costs are for well researched lessons in skill training. They are less expensive, but not dramatically less expensive, than video production of equal quality (but more expensive than video lectures). The main savings of slide-tape over video is in the cost of duplicating the lessons and in the playback equipment.

b. Use of Graphic Art

The typical cost of slide-tape includes a major art cost. American Analysis seldom uses live photographs in their lessons. Instead, artists draw the actual visuals required. They have found that live photographs of lesson content often confuse the viewer due to an over abundance of visual cues. Their artists isolate the content of a visual, subdue the "noise" or cluttering factors and highlight the essentials.

For example, in teaching clerks to operate an office machine the analysts map out the operating procedure exactly as the viewer would see it; then artists reproduce the procedure frame by frame. They highlight dials, subdue unimportant details, and isolate the significant detail.

This process evolved after many problems with photography, including the high costs. Often the photographers missed the shot needed by the lesson designer. Or after the photographing session a lesson designer needed a different angle or different lighting or focus. The end result of their experience was adoption of an animated format with the use of cartoon characters to guide the learner through the lesson. Pacific Telephone uses the same process to train telephone and telegraph operators.

3. Use of Audio Cassettes

As mentioned earlier, audi-cassettes can be used to help train people in accounting, typing and other business skills. They have also been used for businessmen. (Cassette players installed in cars provide useful instruction and pass the time during busy traffic hours. The content is usually a reproduced lecture on recent business practice and strategy.)

In skill training, audio cassettes are used as guides for operating office equipment. American Analysis produces audio cassettes in the same way they design their slide-tape lessons. They program them so a trainee can follow the tape and operate or service a machine at the same time.

While the procedures to plan and produce an audio cassette lesson are similar to those for a slide-tape production, the costs are much less. A course in audio cassette will cost typically less than one tenth as much as a comparable course in slide-tape.

In the Junior College course in accounting, 27 tape cassettes were used as well as a programmed workbook and a printed copy of the script.

The 27 cassettes sold to the students for $100, the workbook and script for $10 each. The printed scripts allowed students with difficulties in English to review the material in printed form.

Users of the course report that:

(i) The use of audio cassettes freed the instructor from repetitious, tedious lectures and made him available for individual tutoring. Classtime was reduced but the instructor remained available on a drop-in basis. The majority of students were able to pass the course by attending classes for three instead of five hours per week. Many did not require further tutoring, so the instructor spent more time with the slower students. Many of the "A" students did not attend the class; those who had portable cassettes worked at home. Others worked in the media laboratory under the informal guidance of a student assistant.

(ii) The course increased the number of students by 48%.

(iii) Due to the use of Black and Chicano students as laboratory assistants, the audio tape tutorial approach increased the number of minority students who successfully completed the course.

(iv) The laboratory assistants were students who had previously completed the course and were capable of effective tutoring.

Where visual information is not an important part of the lesson content, the audio cassette can be an effective means of teaching the skill be it in computational procedures or operation of a machine. It is much less expensive than either video or slide tape.

4. Use of Video and Film

As mentioned in Section B of this chapter, several of the institutions studied had switched completely to video cassette for teaching their courses. While the cost is typically greater than audio cassette or slide-tape format, they felt the advantages of the video medium was well worth the investment. The Bank of America's costs break down to less than $5 per student session when the costs of the centrally produced tapes are distributed over students in 1,100 branch offices. The content of their courses is given in Appendix C.

Without the video system, the Bank of America would not be able to offer similar training to its branch office personnel. According to

them, the cost of providing similar training with conventional instruction would be prohibitive. Furthermore, the uniformity and immediacy offered by the video program would be lost.

In comparing video cassette with tape-slide production, the cost factors must be carefully weighed, application by application. An hour's lesson of "talking head" type lecture on video cassette can be produced at less cost than a well-planned and produced slide-tape presentation. But a complex video production can cost far more. The cassettes and playback equipment for the video is more expensive than audio cassette or tape-slide, but the importance of these viewing costs depend on the numbers of students using the course and the amount of time the equipment is used at the training facilities. Where the content of the material would allow use of audio cassettes, there are strong cost arguments to adopt that medium. Where visual materials call for either tape-slide or video cassette, then there is an advantage of video if simple lecture production is adequate. If more complex production is called for then slide-tape would have an advantage if no motion is required.

One of the unique values of video cassette or film is, of course, to capture motion. If motion is a critical aspect of a skill, then media training must incorporate that motion in instruction. In training a service technician to detect problems in a sophisticated piece of equipment, it is essential that he view the mechanism in operation. For example, Hewlett-Packard trains its worldwide sales and service force with elaborate color video. The produce detailed programs on everything from pocket calculators to sophisticated computers. On video they must capture the precise realism and movement of complex mechanisms which are essential to the performance of the equipment. Any other media except video or film could not perform this function.

Film is often used in production of skill training courses but video cassette is better suited to distribution. Where video equipment is too clumsy for intricate pictures or where lighting is better adapted to film, companies like Hewlett-Packard prefer to use film. After filming they transfer the film content onto video to be edited and produced on video cassette.

The companies studied prefer video cassette for distribution because of its compactness and durability. For Hewlett Packard, this is

a critical factor since they distribute cassettes to 41 countries, then reuse the cassettes two or three times. The Stanford Medical School media library has the same reasons for preferring cassettes over film. They are presently converting their slide tape and film collections to video cassettes.

A mode that should be discussed for completeness is broadcast video. When the audience to be reached in a coverage area is large, the television broadcast mode is the least expensive. The cost of the central broadcast transmitters in most cases will be much less than the costs of individual video cassettes and playback equipment, slide-tape and their playback equipment and, in some cases, audio cassette (although in this application comparison with radio is more relevant). The costs of a television or radio set at the viewer's location is less than the cost of the recorded media lessons and the playback equipment for each viewer. These savings will easily overcome transmitter costs when a large number of viewers are in the broadcast area.

The reason for not considering broadcast television (or radio) in occupational training is the need for individually paced instruction. As mentioned in Part 1 of this section, the students have to be able to interact with the procedure or equipment to learn the skill. In addition, most occupational training should be able to be used at different times of the year to suit the hiring institution's needs. Broadcast media in occupational training allow neither the flexibility of the student interacting with the media learning process nor the scheduling of training programs to suit the employer. For these reasons, broadcast media are not well suited to occupational training.

However, the broadcast media is well suited for lecture or informational type instructions, particularly where more regular viewing habits can be counted on.

Chapter IV
Use of Media in Training Industrial Production Personnel

A. INTRODUCTION

This chapter considers the use of media in the training of industrial production workers. There are a very large number of skills that fall into this category; yet most of them follow a similar pattern. Industrial occupations usually require knowledge of a semiskilled or highly skilled procedure or operation of simple or complex machinery. Such skills are needed for the occupations of spinners, weavers, knitters, dyers, bricklayers, carpenters, transport equipment operators, mechanics, repairmen, etc.

This study examined one of the leading producers of industrial media in the United States. (See Appendix B on American Analysis Corporation.) In addition, it surveyed a number of companies that produce their own skill training media. Although the skills reviewed were not identical to Iran's needs, they were essentially the same. Most skills, whether in Iran or the U.S., require a knowledge of a procedure or operation of a machine. Thus, the use of media in skill training observed in this review is quite relevant to Iran's needs in industrial training.

The chapter considers first the characteristics of the trainees. Then it describes factors important in determining the appropriate media to use. Finally, it describes factors of production distribution and implementation.

Because the clerical skills discussed in the previous chapters also involved the learning of procedures and operation of machines, much of the information presented there also applies here. The differences are subtle yet they have important implications for media producers. The main difference between training clerical workers and factory workers lies in the nature of the audience.

B. AUDIENCE CHARACTERISTICS

Generally, the factory worker trainees have:

(i) less formal education,

(ii) lower motivation for advancement, and

(iii) are more inclined to active, as opposed to passive, learning.

The companies studied reported that many of their factory employees are graduates of technical institutions or came out of the vocational stream in high school. Thus, their verbal literacy is relatively low which means that printed materials are not effective in training. But more importantly, their learning patterns differ dramatically from the clerical, sales, and service personnel. They are generally intolerant of lengthy lectures or discussions. To learn a new procedure or how to operate a new piece of equipment, they prefer to work directly with the equipment. Usually, they learn quickly by watching someone else operate the equipment and by trying it themselves. The learning process usually takes place with a minimum of words.

For instructional media producers this means an emphasis on visual presentation. It means accompanying the lesson with the actual equipment or models. Or, where the equipment cannot be more available, it means relying on elaborate visual productions of other workers operating the equipment. Words must be minimized and restricted to key phrases which act as specific cues to performing the job. Extensive description unrelated to performance only confuses the trainee and distracts him from his own more visually oriented learning pattern. (For further discussion of production techniques see Appendix B.)

Also, since the audience's motivation to learn is relatively low, monetary rewards are an effective component of training. Hewlett Packard reports that if factory workers are aware that a media lesson may mean a salary increase, the attention and results improve considerably. Similarly, the U.S. Army recruits improve attention when a media lesson offers them a raise in rank and salary. If external motivation is not possible, some compensation can be made by designing other forms of motivation into the programming itself.

Another problem encountered by producers of industrial training media occurs when the audience has no previous familiarity with the job or skill to be learned. Even if a trainee is motivated by the possibility of obtaining a job, he may still have difficulty in following a media lesson. American Analysis' instructional technologists identify two solutions to this problem. They find it helpful to (1) provide opportunities for the trainees to observe the skill in its natural setting or (2) provide a film overview of the job being performed.

Two other problems arise for producers concerning the audience, media literacy and the absence of learning skills.

Media illiteracy refers to the inability of a trainee to understand the medium of instruction. For example, a viewer must be able to interpret visuals as representations or facsimiles of reality; he must be able to follow cuts in the action and rapid changes in time and location. If mediated instruction is to succeed, the audience must obviously be visually literate. But media literacy can be learned.

Even if an audience is motivated, somewhat familiar with the task, and visually literate, poor learning skills may inhibit the success of a lesson. In this case, in order to effectively teach with media, the media producer must first teach the learner "how to learn." In working with slow learners among Army recruits, American Analysis had to teach trainees a method of learning. They did this implicitly by adopting a standard format to their media lessons which learners could apply to each lesson or any new task. For an elaboration of this technique, see Appendix B.

C. CHOICES OF MEDIA

As described above, training industrial workers is a more delicate process than managerial or clerical training. And since it involves more elaborate production techniques, it is consequently more expensive. Companies find it more expensive because they do not utilize the less costly video lecture used so frequently in managerial training.

Except for the inadequacies of the video lecture and of printed materials, industrial worker training utilizes the same media mixes as described in the previous chapter. For the companies like Bank of America, Hewlett Packard, and others who have converted their facilities exclusively to video, all of the programming for factory workers was in video cassette.

The criteria for selecting the most appropriate medium or media mix are the same as outlined in the previous chapter. For skills that can be learned from still photographs and audio script, the film strip or slide-tape is adequate and least costly in most applications. If the critical part of a skill is its motion, then super 8mm film, a modified 8mm film (such as that used by American Analysis Corporation) or video cassette is necessary.

If a skill is not too complex or unsafe for self learning, then audio cassette and/or visual cue cards can adequately guide the learner through the task. According to the U.S. Army, the audio cassette mode is their most effective skill training technique.

Programmed texts, if designed primarily in a visual mode, are also effective. Like audio cassette, program texts enable the learner to actively participate in learning a skill. The cue cards serve a similar purpose and can be used on the job after a slide tape or video lesson. For example, United States Army recruits learning operation and maintenance of trucks and other vehicles are given in the following sequence:

(i) They view a series of slide-tape lessons.

(ii) They practice pre-operation checks on the truck itself with the aid of an audio cassette lesson.

(iii) Finally, they conduct the checks with the aid of visual cue cards.

Many varieties of skills can be taught with the same sequence of media use.

D. IMPLEMENTATION CONSIDERATIONS

The same considerations outlined in previous sections apply to industrial skill training. The subtle differences arise due to the makeup of the audience. But generally, the merits and problems of producing and distributing media are the same. At the implementation level there is one addition: Personnel developers and media producers recommend that, after viewing a media lesson, trainees should practice the new skill as soon after the lesson as possible. For example, Hewlett Packard sets up their color monitors in an anti room to each factory. After an assembly worker views a program on a new procedure or process, he can immediately try the skill. Of course, that is assuming the new equipment is available. Other programs simply aim at improving work on a familiar piece of equipment or motivating better job performance. After viewing one of these programs, the supervisor immediately organizes the work anew and implements the new approach. If there are problems and questions, the supervisor is available to answer them.

The advantages of using media in industrial training are similar to those in training other skill areas. Those that use media feel that

(i) The new training programs can be distributed throughout the institution more rapidly by distribution of the media training packages. Even with video cassettes this is less expensive than sending highly trained instructional personnel on a tour of the different facilities.

(ii) The media training programs reduce the time spent by the supervisors to teach the same skill to new factory workers.

(iii) When high quality production is used, the programs can provide an entertaining break for the employees at the same time new ideas are introduced to improve production.

The factors involved in choosing the form of media and whether or not to use media vary greatly from occupation to occupation. The benefits described above in many cases will warrant introduction of media lessons, particularly where the number of people that are to be trained is large enough to warrant carefully prepared media lessons.

It should be noted, however, that in many industrial skills the procedures are simple, the variations from business to business are large enough to require different procedures for each employer, and on-the-job training without use of media is the most effective method. In selecting industrial training projects for media production, care should be taken to choose skills for which there is a large demand with similar procedures required in different institutions.

As with the clerical and sales skills, the need of the learner to interact with the medium and the need of the employer to start training at his convenience precludes the use of broadcast television or radio.

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APPENDIX A

INSTITUTIONS CONSULTED IN THIS STUDY

INSTITUTIONS CONSULTED IN THIS STUDY

In researching the uses of media in occupational training, the author has drawn from the experiences of the following agencies:

American Analysis Corporation, San Francisco, CA
American Telephone and Telegraph, San Francisco, CA
Anthony School of Real Estate, San Francisco, CA
Bank of America, San Francisco, CA
Hewlett Packard, Palo Alto, CA
Los Angeles Police Academy, Los Angeles, CA
Skyline Junior College, San Mateo, CA
Stanford School of Medicine, Stanford, CA
Syntex Inc., Palo Alto, CA

In addition, the author has drawn from his experience as an Instructional Technologist for American Analysis Corporation, an educational media consultant to the California Bar Association, and is presently a doctoral candidate in the School of Education at Stanford University.

A. AMERICAN ANALYSIS CORPORATION (AAC)

AAC serves as one of the leading instructional materials producers in the U.S. They have produced multimedia training packages for industry and business around the world. Their largest contract is with the federal government, specifically the United States Army, who are currently duplicating 100,000 media lessons per month. AAC produces all forms of media instruction, from video cassette to programmed text. Most of their work centers on a modified slide-tape cassette which includes motion and frame by frame stills. Their unique production process, as described in Appendix B, is a valuable tool for any agent considering media training.

B. AMERICAN TELEPHONE AND TELEGRAPH (AT&T)

The San Francisco office of AT&T predominantly transmits and records managerial messages and conferences on video cassette. They control a national closed circuit television system which is used to communicate from their East Coast headquarters to subsidiaries throughout the United

States. Yet, at their San Francisco office they do not produce elaborate programming. According to their audio video director, it is less expensive ($1,000 per day) to subcontract their production needs to outside agencies. The outside agencies provide mobile production units, actors and script writers. AT&T only provides the subject matter expert.

AT&T's unique contribution is its multimedia approach to managerial decision-making, as described in Chapter II, "managerial and administrative uses of media."

C. ANTHONY SCHOOL OF REAL ESTATE

Anthony Schools conduct Real Estate classes in 10 junior colleges throughout California. After one year of classes, graduates obtain State real estate and broker licenses. To offset high instructor costs and rising student enrollment, Anthony Schools operate a $100,000 color video studio where they produce video lectures for their classes. At least half of their classes are conducted by video tape. The instructor heads discussion in the remaining half. In some locations, where it is uneconomical to send instructors, secretarial assistants play the tape and handle administrative duties, but the class runs without an instructor.

In another attempt to offset costs, studio and equipment facilities are rented to commercial and public interests.

D. BANK OF AMERICA

Bank of America operates a $3,000,000 color video studio that produces business and industrial programming for 1,100 branch offices throughout California. They have a large staff of instructional technologists and audio visual technicians and the fiscal support of upper management to convert the bulk of their personnel development to video. Although 80% of Bank of America's present programming is illustrated lecture, their Director predicts a reversal of that figure to sophisticated production. In 1975, Bank of America won an impressive United States award for best industrial production. They are quoted extensively throughout this study.

E. HEWLETT PACKARD

Hewlett Packard, a rising giant in industry and in media use, also operates a $4,000,000 video production studio and professional staff. Their video production system communicates with 100 offices and 41 factories around the world. They use elaborate video productions and the video lecture to replace their sales and service support corps, train factory workers, communicate the latest innovations to their subsidiaries, train neophyte personnel, and periodically a video cassette usurps an executive's presence at a European convention. They presently produce 125 programs per year but the trend is to increase this number.

F. LOS ANGELES POLICE DEPARTMENT

See Appendix C on the MILE project.

G. SKYLINE COLLEGE ACCOUNTING DEPARTMENT

Skyline College operates a media center with 125 individual study carrels equipped with slide-tape viewers, video cassette viewers and earphones. They also operate a three-camera black and white video production studio and an extensive library of media programs.

The accounting department, in conjunction with the media center, produced a 27-cassette audio and print course on "Introductory Financial Accounting," which is presently in use in three accounting classes. The $100 audio cassette, $10 booklet and $10 script have been published by a commercial publisher and will be available to other schools. Their low cost production and usefulness to accounting students are valuable reminders of the use of "little media" to achieve big results.

H. SYNTEX INC.

Syntex, a California-based international pharmaceutical company, utilizes a modest three-camera video studio for intracorporate communication and to train their 350-man sales force. They use video to provide their salesmen with model interviewing techniques and to update their technical expertise. For the latter, they purchase technical tapes at up to $250 each and lease them for $35, and then circulate them by mail to their sales force. Another use of video lies in training the sales force in interviewing

techniques. They videotape a salesman in a mock interview. Then the salesman views himself on the playback. The role playing and opportunity for immediate self-criticism could only occur with video.

I. THE STANFORD SCHOOL OF MEDICINE

The Stanford Medical School operates a multimedia production studio that provides supplementary materials to instructors. Since the Medical School falls into the higher education category, it was not entered in this study. Although their media catalog is attached to suggest the scope of media in training doctors, nurses and medical technicians.

APPENDIX B

EDUCATIONAL TECHNOLOGY AND SKILL TRAINING:

A REPORT ON AMERICAN ANALYSIS CORPORATION'S APPROACH

TO MEDIATED INSTRUCTION

EDUCATIONAL TECHNOLOGY AND SKILL TRAINING: A REPORT ON AMERICAN ANALYSIS CORPORATION'S APPROACH TO MEDIATED INSTRUCTION

American Analysis Corporation's (AAC) conception of education centers on educational technology. They believe that communication of any skill, information or understanding requires an efficient and economic combination of media appropriate to a specific skill and a specific audience.

- Each target audience is unique. Detailed audience analysis combined with a thorough understanding of the subject matter determine the media to be utilized, sequence of the learning process, pace of the lesson, level of visual and verbal language and length of the lesson.

- Skill learning requires performance oriented instruction. Lessons answer the learner's question: What must I know to be able to do the job? For example, to start a 1969 Saab, the learner needs to know: (1) Set the gears in neutral; (2) Pump the gas peddle twice to the floor and back to catch the automatic choke; (3) Turn the key and release when you hear the engine operating. The learner does not need to know how many cylinders there are, the specifics of the choke operation or the weight of the car. Extraneous information distracts the learner from the task at hand.

- To competently perform a skill over an extended period of time, other than immediately following a lesson, the learner must attain a limited understanding of what he is doing. If the learner understands his actions he will not only retain new information longer, but he will be able to adapt to variations in equipment or environment and be more likely to innovate. Although "understand" is a fuzzy word, a lesson designer translates it into performance terms by answering the question: What must the learner be able to do to demonstrate that he understands? For example, to help a learner to remember to pump the gas peddle of the Saab, he needs to know that pumping sets the automatic choke which provides the necessary gas to a cold engine. To determine if the learner understands his actions, the lesson designer might include the question: Why do you pump the gas peddle before turning the key? If he responded, "To set the automatic choke," he would demonstrate his understanding.

An action or concept taught is not learned unless a learner responds either manually or verbally to the problem that arises when he is on the job.

Lessons adhere to stimulus-response-reinforcement theory. If the Saab lesson was in the visual mode, the visual accompanying the question: When starting the Saab, what do you do first? would be the same view that the student would see if he was sitting in the driver's seat. In this case, the real world view of the inside of the car is the stimulus. The learner's answer is the response he must make on the job. A follow-up answer check would be his reinforcement.

Lessons do not only teach subject matter, but also pattern a way of learning. At the outset of each lesson the learner finds out what he is going to be able to do when he completes the lesson. Next, he learns that the lesson will be broken down into units and there will be an order in which the units will appear in the lesson. Before the lesson content begins he also learns that at the completion of each unit he will be asked to respond to questions or perform on the equipment, first for practice, then in test conditions. In other words, the lesson entails no surprises. The learner knows where he is going, how he will get there, and how to know when he arrives. AAC has determined that clearly mapping out the learning process accelerates absorption and retention of lesson content and also teaches the student a process to apply in other situations.

Learning itslef is entertaining; elaborate Hollywood media productions are unnecessary. When a learner responds accurately to test items and finds himself able to perform a new skill, he gains an intrinsic satisfaction for learning and an eagerness to return for more.

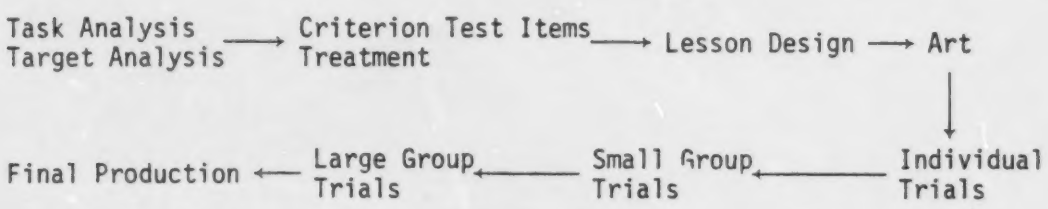
Learning is individualistic. Lessons are designed for individual study where the learner controls the pace, reviews if he needs to or skips ahead if he is already familiar with a particular unit. (Lessons designed for a homogeneous target population can be successfully utilized in a group mode. In this case, a laboratory assistant adapts the media to the slowest member of the group.)

PRODUCTION FLOW CHART (see Table 1)

The educational technologist (lesson designer) interns with a client's subject matter expert until: (1) he can competently perform the particular skill and, (2) satisfy colleagues that he thoroughly understands the theoretical issues underlying the skill. Often he surpasses the knowledge of a subject matter expert and even locates problems that have been dysfunctional for decades.

TABLE 1

PRODUCTION FLOW CHART



To analyze the target population the educational technologist surveys student responses to conventional lectures and media, observes performance capabilities in a pre-test situation, and determines visual and verbal literacy levels.

Criterion test items are formulated according to what the student needs to know to do a job. After successfully completing the test items the student should have the information needed to perform a particular skill.

In the lesson treatment, the educational technologist maps out the most efficient media mix, the lesson's performance objectives, the breakdown of the content into units, the sequence of the units, the practice exercises, and the number of half hour lessons in the series. Before submitting his analysis to a client, he presents his treatment to a team of colleagues, editors and artists for their edification.

If the lesson requires stop action super 8 or video, the next stage is to detail the visuals and script in rough storyboard form.

After an intensive edit and review by co-workers and subject matter experts, the lesson moves on to storyboard art. Lessons in the visual mode are rendered by technical draftsmen and cartoonists unless live action film is more appropriate (which is seldom). Three-dimensional colored drawings are most common because they avoid extraneous stimuli which only detract from effective learning. Most of the lessons are viewed in the presence of the actual equipment that the learner will use on the job. (Elaborate and expensive filming or video taping is unnecessary.

After the artists complete the 150-200 storyboards (which are 8½ x 11 inches in size), typists record the script on each frame, and the lesson moves to its first test -- individual trials. Three individuals from the target audience take a pre-test, then the lesson. The lesson designer conducts the trials and notes confusing visuals and script, surveys student attitudes and suggestions and then observes the success, or failure, of the lesson when the student attempts the skill on the equipment. At this stage a good lesson returns to the studio for minor patching, whereas a disastrous one needs to be totally rewritten.

After patching, the lesson moves to small group trials where it undergoes the same attacks as in the individual trials. Three groups of 10 students take the lesson separately and each group discusses its strengths and weaknesses. At the large group trials the same process occurs with three sets of 30 students.

If the lesson survives trials and a client's whims and wishes to alter the content, it moves on to final production and distribution after a six-month design period.

TABLE 2
SAMPLES OF AMERICAN ANALYSIS CORPORATION USE OF MEDIA IN SKILL TRAINING

Lesson Content	Media Mix							
	Film & Live Equip.	Audio & Live Equip.	Programed Text & Equip.	Poster Cards & Equip.	Film, Check List & Equip.	Film and Model	Film and Partner	Film, Paper & Pencil
FIRST AID								
personal hygiene								x
bandaging	x						x	
artificial respiration							x	
TRUCK MAINTENANCE								
general								x
daily checks		x						
tire changing		x						
USE OF GAS MASK				x				
FIELD TACTICS						x		x
CLERICAL SKILLS								
filling in forms			x					x
using field manual	x							x
USE OF EQUIPMENT								
portable	x							
heavy						x		
simple		x						
complex						x		
RULES & REGULATIONS								x

APPENDIX C

PROGRAM LIST OF THE BANK OF AMERICA

PROGRAM LISTS OF THE BANK OF AMERICA

Working Title	Finished Title	Running Time (minutes)
Video One	same	19:22
Advanced Sales Workshop		100:00
Trust Revised Ed.		30:00
Management Conf. Leasing		15:00
Management Conf. Trust		21:00
Management Conf. Int'l		20:00
CPA'S (2 reels)	CPA's & The Middle Market	70:00
Business Services		60:00
BISD		60:00
CSR Refresher		60:00
20 Tender Traps II - Int'l		41:00
Systematic Selling		8:00
Accounting for Bankers		67:35
COOLS	Cools An Introduction	14:00
Building Office Profits	Money in the Bank	25:00
Social Policy	Evolution of Responsibility	21:30
BankAmerishare	same	16:00
Motivating Your Staff	A Matter of Attitude	22:00
Customer Relations (Dorsey)	Customer Relations	10:30
Post Conf. Kit (North)	You Are Bank of America	15:00
Advance/Marketing	An Old Chinese Custom	8:25
Foundations of Accounting	same	
Post Conf. Kit (South)	You Are Bank of America (South)	15:00
Scenic Shots		20:00
Accounting	The Balance Sheet	60:00
	The Unshakeable Man	26:00
Customer Relations (Witte)	The Customer (Public Version)	19:00
Accounting	The Income Statement	47:00
The Customer (Bank Version)	same	18:30
Accounting	Accounting Changes	39:00
Trust Makes the Banker		

PROGRAM LISTS OF THE BANK OF AMERICA (cont'd)

Working Title	Finished Title	Running Time (minutes)
Accounting	Profit Analysis	45:00
Accounting	Math Principles	53:00
Advance II	Savings & the Handshake	7:40
Animated Logo	Logo Opening	00:10
Vari-Rate	Vari-Rate Home Loans	4:30
Accounting	Monetary Assets	55:00
Accounting	Inventory	54:00
Accounting	Investments	
Accounting	Long Term Assets	
Accounting	Liabilities	
Accounting	Pensions & Leases	
Accounting	Corporations	
Accounting	Tax Allocation	
Simple Interest	"Keep it Simple"	11:30
Building Office Profits II	"Understanding Branch Profit"	
Account Transfer Service	"Account Transfer"	26:30
Loan Profitability	same	
	Big Jeff Casefile #1	11:00
	Big Jeff Casefile #2	14:45
	Big Jeff Casefile #3	15:18
	Big Jeff Casefile #4	13:50
	Big Jeff Casefile #5	
	Big Jeff Casefile #6	
	Big Jeff Casefile #7	
	Big Jeff Casefile #8	
Advance Three	Summer TV Advertising - 1976	
Time Management	The Time of Your Life	28:00
MVS Orientation (The Test Conversion)	MVS Orientation	48:48
IBM 3890 Document Processor, 1 Part Series	IBM 3890	
IBM 3890 Part II	IBM 3890	
Remember	same	

PROGRAM LISTS OF THE BANK OF AMERICA (cont'd)

Working Title	Finished Title	Running Time (minutes)
Equal Credit Opportunity	same	26:30
IBM 3890 Part III	IBM 3890	
LCI Learner Control Instruction	Learner Control Instruction	
Ad-Vance Four	The Sure Thing & Fourth Quarter Advertising - 1976	7:21
The United Way is People (N)	same	14:10
The United Way is People (S)	same	13:30
Video BankAmerican		
The Interview	same	
	Proven Call Technique #1 Appointment	11:00
	#2 Approaches	13:08
	#3 Questioning	11:26
	#4 Closing	11:50
Career Counseling	same	
	BankAmericard:	
	#1 - Backed by Service	12:44
	BankAmericard #2 - Good Thru Experience	11:35
	BankAmericard #3 - A Change for the Better	10:47

APPENDIX D

DESCRIPTION OF THE

MULTIMEDIA INSTRUCTION FOR LAW ENFORCEMENT (MILE)

AND

TRAINING MANAGEMENT SYSTEM (TMS) PROGRAMS

Description of the Multimedia Instruction for Law Enforcement (MILE) and Training Management System (TMS) Programs

INTRODUCTION

Less than 50 years ago, new Los Angeles police officers, after meeting minimum requirements, pinned on their badges for the first time and immediately began the job of protecting the City. They received no formal training, and were consequently forced to learn their duties while on-the-job from other police officers, or through a trial and error process.

The Department conducted its first formal effort to train new police officers in 1924, and since 1936, all recruits have received some form of entry-level training at the police academy.

Methods and materials have changed to a considerable degree over the years, but the basic goal of producing a capable and efficient police officer has remained the same. All of our innovation and experimentation has always been aimed at providing today's officers with the superior knowledge and skills they need to handle the complex law enforcement problems of an urban society like Los Angeles

IMPORTANCE OF THE TRAINING FUNCTION

Our personnel, particularly our field officers, are the keystone of any effort to prevent and suppress crime. It is therefore imperative that each and every officer possess the conceptual tools required to perform his multi-faceted job in an efficient, accurate

and professional manner. The training function is responsible for assisting the Department to make fullest utilization of a limited field force in serving the citizens of Los Angeles. Extensive training programs represent a costly and time-consuming investment, but a police department can ill afford the long and short-range cost of failure to provide accurate, adequate, and timely training.

THE MILE PROGRAM

Until recently, the Department's 800-hour recruit training program was almost completely conducted using the time-tested lock-step, large group lecture method.

But in 1968, an intensive program was begun to design a more effective and innovative training program, in order to meet the increasingly critical need to have adequately trained police officers. Five years later, in 1973, the new training program known as "Multimedia Instruction for Law Enforcement" or MILE, was implemented. As a result of MILE, the live lecture method is no longer used exclusively. Live lectures are still used when they are evaluated as the most instructionally sound media. Instead of traditional methods, MILE uses self-paced, individualized and multi-media instructional methods.

WHAT SELF-PACED MEANS

When we say that the instruction is self-paced and individualized, it means that recruits progress through the training program basically at their own speed, and work on their own. Many of the training materials consist of workbooks and videotapes, so that a recruit can review a lesson with which he is experiencing

difficulty as many times as necessary. When he feels ready to be tested so that he can progress to the next module, he takes an exam in the Testing Center. If he does not pass the exam the first time, the recruit is counseled by a class squad advisor and additional study time is scheduled. At this time, our policy is to allow recruits three attempts to pass written exams. A different test version is given during each attempt.

The MILE approach to training addresses the fact that individuals do not learn at the same rate, nor do they all learn equally as well from the same teaching method. In addition to videotapes and written study materials, the MILE program blends the use of small group discussions, simulation exercises, and lecture, depending upon the method most suitable for teaching specific portions of the curriculum. As a result, individuals with verbal, non-verbal and mixed learning styles are equally provided an opportunity to attain the minimum scores necessary to graduate from the Academy.*

A verbal learner prefers to take information in either printed or lecture formats and develop concepts from that information. Non-verbal learners have difficulty learning concepts from lecture/print materials and prefer to have information presented as demonstrations, roll playing, diagrams, etc., where concepts are presented as actual visual relationships. Mixed learners have no preference and can learn equally well from either format.

* (The determination of learning style is taken from individual scores on the Language and Non-Language portions of the Short Form Test of Academic Aptitude.)

ROLE OF THE INSTRUCTOR UNDER MILE

Since the implementation of MILE, the traditional role of the instructor has changed. A team of three senior police officers, who are called Squad Advisors, are assigned primary responsibility for recruit academic progress. A team of squad advisors remain with each recruit class over the entire 20 weeks of recruit training. The squad advisor is the recruit's supervisor, teacher, and counselor, and is responsible for providing an atmosphere in which the recruit can motivate himself to achieve maximum progress through the self-paced curriculum. Instead of being subject matter specialists, as under the lock-step method, MILE squad advisors must qualify as instructional generalists capable of responding to recruit officers' queries on any subject in the curriculum.

PLANNING PRECEDED THE MILE APPROACH

Adopting the MILE approach to training was in no way a whimsical decision to merely change the existing program. The new approach was preceded by extensive grant-funded studies, and specific planning to combine modern instructional technology with current knowledge concerning the psychology of learning.

MILE TRAINING IS BASED ON TERMINAL PERFORMANCE OBJECTIVES

First of all, as the basis of the new training program, the Department conducted a job analysis of the basic police officer's duties. This monumental task consisted of identifying and documenting the more than 200 individual tasks which together comprise a comprehensive itemization of the field police officer's duties. These 200 required knowledges and skills were then written as very specific training objectives, which we refer to as Terminal Performance Objectives or TPO's.

TPO's are the foundation of the entire MILE program. Each TPO defines a task required of a field officer, and each TPO is assigned a weight factor which reflects the criticality and frequency of the task for proper job performance. All TPO's are regularly submitted to validation against the actual tasks being performed in the field. Each TPO further defines the amount of time that should be allowed for the trainee to demonstrate his knowledge of the required skill or knowledge. A clear distinction is made between minimum performance expected from recruits, and minimum performance expected from police officers with 3 years' experience.

Because training is based upon minimum performance levels, a recruit's academic achievement is no longer compared to the other members of his class, but rather to his individual attainment of predetermined minimum scores.

BENEFITS OF THE MILE PROGRAM

A number of substantial benefits have been derived as a direct result of the improved training techniques incorporated in the MILE program.

First and foremost, the Department has found that the MILE system, based upon TPO's, is the best way to ensure that training conducted in the Academy is specifically based upon the job the recruit faces after he graduates. Compared to previous training systems, the MILE program more adequately addresses the specific skills and knowledges that a recruit must master to perform his duties following graduation. The effectiveness of individualized instruction has been documented by numerous independent research and evaluation efforts. Studies indicate that the MILE approach actually reduces

the average amount of time required to master a module of instruction. Furthermore, MILE has served as a method of salvaging those recruits who would ordinarily be lost in a "lock-step" system. This is due to the fact that the program is much more amenable to the intensive remediation efforts needed to assist recruits whose learning style is primarily non-verbal. The remediation aspect of the program has been invaluable in assisting the Department to meet its affirmative action goals and to reduce attrition rates. Since MILE has been in operation, the attrition rate at the Academy has been significantly reduced from 40% in 1973, to an average of 17% in 1975. Furthermore, the time necessary to identify an academic failure for which remediation would be ineffective, has been reduced from 11 weeks to 8 weeks as a result of MILE.

The salary savings from reduced attrition and earlier identification of these serious academic failures amounted to an estimated $437,580 in 1975. These savings have more than offset the additional costs incurred by hiring the six new personnel, who were needed to operate the MILE program, in addition to the existing training staff.

Finally, it has also been proven that the packaging of instructional materials provides control, standardization, and for the most part, is more economical than the previous "lock-step" system. Although initial developmental costs may appear high, the continuous use of the materials, in the long run, makes their use cost effective.

HISTORY OF FUNDING FOR THE MILE PROGRAM

A number of federal grants have been awarded to the Department to finance the 6-year evolution of the MILE program.

TRAINING SYSTEM STUDY

The first grant was obtained in 1969 from a State agency, the California Council on Criminal Justice (CCCJ), which is now known as the Office of Criminal Justice Planning (OCJP). This grant, in the amount of $93,000 is known as Phase I of the Training System study. Under this program, grant monies were used to enter into contract with North American Rockwell Information Systems Company (NARISCO).

NARISCO's job was to take the Terminal Performance Objectives, which had already been developed by the Department, and to propose a new training system which would be based upon the TPO's. NARISCO concluded that a completely individualized, self-paced and multimedia instructional system would be the most cost-effective and flexible method of training police officers; NARISCO also recommended that the new instructional system be computer managed.

Under the second phase of the Training System Study grant, a prototype of the training system proposed by NARISCO was developed. Another contractor, General Behavioral Systems, was hired to develop individualized instructional materials for a small segment of the recruit curriculum. Film slide tapes, audio tapes, programmed workbooks and instructor guides were designed. These materials were evaluated for instructional effectiveness by an independent consultant, who was also hired with grant funds. The total amount of the second Training System Study grant was $77,000.

MILE PHASES I AND II

After the prototype self-paced materials were evaluated, the Department was convinced that the majority of the recruit curriculum should be converted to multimedia, self-paced methods. As a result,

all appropriate portions of the recruit curriculum were produced as individualized training under two of the subsequent three Multi-media Instruction for Law Enforcement (MILE) grants.

Under MILE Phase I and Phase II, a number of contractors were hired and major progress was made toward completely redesigning the existing recruit training methodology.

Contractors were hired to develop and produce training packages in individualized format, using video and audio tapes, workbooks, and instructor guides.

And, as under the previous grants, the Department hired other contractors to evaluate the academic acceptability of the training materials. In addition, these contractors also trained Department personnel in techniques of evaluating training materials. At the same time, Department staff members were busy preparing to implement the new training program. 103 individual enclosed student study carrels were designed and purchased; each carrel was equipped with videotape players, TV monitors to view the videotapes, audio cassette players, and individual head sets.

MILE MATERIALS ARE NOW PRODUCED IN-HOUSE

In order to allow the Department to produce new videotapes and to have the capability of revising old ones to keep the curriculum up-to-date, grant monies were provided to acquire both a fixed color television production studio and mobile color video van for on-location video production. Furthermore, Department personnel were trained to operate the equipment, so that complete in-house videotape production would be

possible. As a result, the Department is now able to produce new color videotapes as needed, as well as to revise portions of older ones without the need for further contracts with outside film production companies.

At the same time Department personnel were acquiring television production skills, a Research and Design Unit was created and trained to develop the entire spectrum of multi-media instruction materials and select the most effective instructional strategy.

TOTAL MILE PROJECT COST

The total MILE project cost was approximately $4,652,249, although the actual cash outlay from the City was $80,585, or less than 2% of the total system cost. When the operational costs for system maintenance and direct costs in terms of hard cash outlays are compared to the programmatic benefits and annual dollar savings resulting from the MILE system, the result is considered to be a cost-effective system producing a more adequately trained officer.

The Department has realized several ancillary benefits as a result of implementing the MILE program. The mobile color video van has already proven to be a valuable asset in tactical situations, crime scene investigation, and in developing in-service training material. Furthermore, the expertise gained in script writing and the preparation of training material in a multimedia fashion has enabled Department staff to develop superior standardized training packages for field personnel.

TRANSFERABILITY OF MILE TO OTHER LAW ENFORCEMENT AGENCIES

Steps have been taken to assess the regional applicability of MILE training materials. Several local law enforcement agencies and two police training centers have participated in reviewing and rating the materials as applicable, applicable with minor modification, applicable with major modification, or inapplicable to their agencies. The overwhelming response has been most favorable and encouraging.

In general, it appears that most of the MILE-produced materials can be utilized by other law enforcement agencies, although minor modifications may be required to accommodate policy and procedural differences between agencies.

To date, 65 law enforcement agencies and/or training facilities throughout the world have purchased all or part of the MILE curriculum. The Department currently receives an average of one request per week for MILE-produced materials.

Thus, the MILE project has provided the law enforcement community with a core of multimedia instructional packages that actually can be duplicated and used by other agencies for the training of the basic police officer. The system is a model representing the state-of-the-art in advanced instructional technology, and as such, its applicability extends throughout the entire Criminal Justice System and even into the area of vocational training and education.

THE TRAINING MANAGEMENT SYSTEM

As the MILE approach to training was being developed, it became apparent that a more efficient method was needed to manage the administrative functions associated with training, such as scheduling facilities and instructors, grading exams and recording scores, and keeping needed personnel data on file. MILE had provided the needed instructional technology; management of the training process was the next problem to be conquered.

SIZE AND COMPLEXITY OF THE TRAINING FUNCTION

Simply coordinating the use of training facilities and scheduling students for courses is a monumental task, considering the size and complexity of LAPD's training job. The training goals of a large police department are far-reaching. We must develop proficiency in new recruits, maintain proficiency in field officers, provide management and mid-management training, and conduct civilian training for a diverse number of civil service classifications. Hundreds of individuals each year are cycled through the recruit training program alone. When the personnel who attended specialized training, management development, in-service courses, and civilian training are included, the number of employees trained annually by the Department ranges from 8,000 to 10,000. Thus, the sheer number of personnel to be trained each year is overwhelming. Yet, the Department's training job is further complicated by the diversity and dynamic nature of our instructional subject matter. Instructional content can literally change daily as a result of new legislation, changes in policy and procedure, and technological advances which can significantly affect the way our employees are

to do their jobs. Sizeable curriculum modifications are therefore common, requiring that revisions be incorporated in all related elements of the affected course, such as test questions and answer keys, terminal performance objectives, course outlines, workbooks, audio and video tapes, syllabi and lecture outlines. Occasionally the job-related changes caused by outside influences are so significant that supplementary training must be scheduled for entire rank levels.

NEED FOR A COMPUTERIZED SYSTEM

A contractor was hired under MILE Phase II to examine the Academy's existing manual record-keeping system. The contractor was to determine whether a manual system would continue to be adequate to support the training function, or if some of the manual functions should be automated.

The contractor's research focused on the overall flow of information concerning the training function. The findings indicated that various units within Training Division require access to some of the same data. Consequently, the manual system of records maintenance was resulting in the costly and inefficient practice whereby nearly identical data were maintained by more than one office. This practice was not only resulting in a wasteful duplication of effort, but it was also contributing to serious data errors and inconsistencies. The contractor also found that the manual information system incorporated another serious inadequacy: it could not supply certain needed information in a timely fashion, and in fact, it could not supply other needed data at all. This is because the sheer volume of information makes it extremely impractical to

capture and analyze certain combinations of data without automated support.

In short, the outmoded manual methods used to administer such a huge training workload made coordinating, evaluating, and validating the instructional process extremely difficult, time-consuming, and costly.

The contractor's recommendation, based upon the shortcomings of the manual system, was that selected portions of the Department's training-related record-keeping function be automated.

Accordinaly, funds were set aside in the third and final Phase of the MILE grant to computerize the clerical functions associated with administering the Department's many training programs. The recommended system configuration would optimize delivery of instructional material to students by predicting the requirements for instructional materials and assets. Further the system would centralize and maintain the records required to manage the training system; evaluate learner achievement, and facilitate revision of courses and all related instructional materials.

The system's overall function is to provide needed training information accurately, and in a timely manner.

THE COMPUTERIZED PROGRAM IS REFERRED TO AS THE TRAINING MANAGEMENT SYSTEM OR TMS

Some of the system's features include:

* a computerized test-scoring process for immediate written indication of individual trainee performance on written tests
* multi-level system security provisions including terminal disabling keylocks, log on codes

and special passwords which are designed to prevent unauthorized access. In addition, potential users must be trained in the system's terminology and operational characteristics in order to access the data base.

* user-controlled routing of reports from one terminal to other terminals or printers
* on-line addition or revision of data
* automatic integration and correlation of the various elements of individual curricula such as TPO's, syllabi, events and tests, for enhanced planning and evaluation effectiveness
* automatic posting of individual test scores to grade files and event records
* automatic rescheduling of trainees who fail or miss a scheduled training event
* centralized index of instructor qualifications
* lecture outline files and indexes
* files for information concerning use and availability of assets and instructors
* more structured approach for sharing information between coordinators of various curricula
* incorporation of extensive personnel data, which will be of particular value in addressing the Department's affirmative action goals and conducting specialized personnel research
* centralized data location

TYPES OF DATA TMS WILL STORE

TMS will incorporate approximately 300 distinct data elements which can be classified into five different types of information. Examples of the types of information which will be stored in the system, as well as the types of reports which will be produced, are as follows:

1. PERSONNEL DATA

The system's Personnel function will include personal and training performance data concerning all employees who attend instructional programs sponsored or conducted by the Department. The following types of data are included:

* Personal Information (name, ID number, height, weight, date of birth, ethnic origin, sex, etc.)
* Academic Performance Scores
* Physical Fitness Scores
* Shooting Scores
* Driver Training Scores
* Education (degrees earned and colleges attended)
* Special Skills (foreign language skills, for example)
* Employment History (information concerning where the individual worked prior to employment with the Department)
* Organization Memberships (clubs, etc.)
* Recruit Evaluation Data
* In-service Training (records of all Department schools attended)
* Assignments (records of all duty assignments with the Department)

* Emergency Notification Information

As this list illustrates, TMS captures such a volume of personnel information that it actually constitutes a "mini" personnel system within a training management system.

The Personnel function will produce the following kinds of data:

* Personnel Data
* Recruit Evaluation Reports
* Class Background Summary Statistics
* Class Performance Summary Statistics
* In-service Training Reports
* Physical Fitness Evaluation Data
* Grades and Test Results
* Academic Ranking Statistics
* Overall Class Ranking Statistics
* Duty Assignment Rosters
* Report of Students to be Rescheduled for Training

The Personnel function will automatically compute student records and class performance indexes. This capability will all but eliminate the laborious and time consuming clerical task of manually updating student files and gradebooks. At the same time, the system will improve the quality of information which is used to make decisions to improve the training program. In similar organizations, systems like TMS have reduced the time required to perform the grading function by 90%, from 40 man hours to less than 4 man hours per week.

2. CURRICULUM DEVELOPMENT DATA

The Curriculum Development function will provide easy definition and modification of all key course documents. The following types

of data are stored:

* Course Organization Control Information
* Materials Requirements (what types of workbooks or note-taking outlines are needed for a course, for example)
* Assets Requirements (examples of assets are classrooms, projectors or other equipment needed to conduct a course)
* Lesson Plan Review Data (dates established for lesson plan review, and names of scheduled reviewers)
* Lecture Outlines
* Lesson Summaries
* Terminal Performance Objectives for each Instructional module, and for the entire course.

The Curriculum Development function will produce the following kinds of information:

* Course Outline Documents
* Course Syllabus Descriptions
* Reports of Course Materials Requirements
* Instructional Unit/Syllabus Sequence Data
* TPO Index Reports
* Lists of TPO's for each course or segment of instruction

3. CLASS PLANNING DATA

The Class Planning function will maintain status information on all classes from the time they are planned, through the participant selection process and during the training process itself. This function incorporates the following kinds of data:

* Class Start Dates and Completion Dates
* Total Instructional Hours
* Enrollment limits for each class

* Name of Class Advisor
* Name, Rank, Duty Assignment Area, and Identification Number of Enrolled Students

The Class Planning function will produce the following types of information:

* Class Rosters
* Reports of Classes in Training on Given Dates
* Statistical data concerning numbers trained, student man-days and class days.

4. EVALUATION DATA

The Evaluation function consists primarily of automated interpretation and output of data accumulated within other functional areas. This function will automatically update individual files and gradebooks to reflect each student's performance. The following kinds of data are stored:

* Test Answer Keys

  A record of all test answer keys will be maintained so that sutdent examinations can be scored by the computer. The computerized test scoring process will operate in the following manner: Each Academy trainee who takes an exam will make his/her answers on a special form. The answer sheet will then be passed through a scanning device which will "read" the coded information and compare it with the test answer key stored in the computer. Within seven seconds, the system will compute the student's grade, and a printer located in the testing center will indicate whether the student has achieved a passing score. Each student's records will then be auto-

matically updated with data concerning his test performance. The system will alert instructors of below-standard student performance, and schedule retraining as necessary. Certain statistics will also be computed for all students with a class who take the same exam. Data will be computed, for example, on how many students successfully demonstrate satisfactory knowledge of each subject area covered on the test.

* Test question and answers

  Individual records of all test questions and all potential answers will be kept on file. As a result, the computer files can easily be munipulated to mix up the sequence of questions produced for a test, and thereby create a new test version without having to have an instructor go through a time-consuming "cut and paste" exercise.

* Staff comments concerning the instructional deficiencies of any course.

The Evaluation function will produce the following types of information:

* Composite reports of course instructional deficiencies or problem areas for further evaluation or action.
* New versions of tests as needed
* Test answer keys
* Detailed statistics concerning individual student responses to each and every test question and answer

The latter information will permit an analysis of how many students missed a particular test question, which answers they chose, and a

comparison of performance by ethnic background, as well as by sex. This capability will be invaluable to the Department in ensuring that test questions are free of cultural bias and that they do not inadvertantly discriminate against persons of either sex.

5. ASSET AND TRAINING MATERIAL CONTROL DATA

TMS will help in scheduling and keeping track of training assets such as classroom facilities, chairs, film projectors, vehicles and printed materials used in training. When a class is initially planned, the system will automatically commit the required training materials. In performing the asset and training material control function, the system will store the following:

* Asset inventory data
* Asset scheduling data
* Training materials descriptions and inventory

The Asset Control function will result in the following kinds of reports:

* Asset indexes
* Asset Inventory Reports for each location which stores assets
* Lists of assets needed to conduct each course
* Training materials indexes
* Training materials inventory reports
* Reports on overdue materials which have been loaned out

STATUS OF THE SYSTEM; EQUIPMENT CONFIGURATION

TMS was developed over the past year by an outside contractor who was employed by the Department under the funding provisions of the MILE grant. TMS was implemented as an operational system in November of 1976. Eleven computer terminals purchased with grant funds are currently in use at the Police Academy, entering data into the computer as an on-line live test of the system.

Each computer terminal consists of two components, a visual display unit which resembles a television screen, and a typewriter-style keyboard. Printers are also available at the Academy to generate hard copies of computer data as needed.

The Academy terminals are connected via telephone lines to a City-owned IBM 370/155 computer located three miles away in the Los Angeles Civic Center. The system utilized dedicated disk data storage on two IBM 3336 Model # disk packs, with a total capacity of 400 million bytes. TMS is designed to operate primarily as an on-line system, although certain processes will be conducted in an off-line (batch) mode. Off-line queries to produce output data can be generaged from the computer terminals, or by feeding a card deck directly into the computer. Data input can be accomplished either on-line, by using standardized data input formats, or as a batch process.

TMS TO BE ENHANCED BY CONTINUOUS DATA INPUT FROM PERSONNEL DIVISION

Trainees remain at the Academy only 20 weeks before they are sent out to employ their new skills and knowledge. Thus, the critical test of training takes place in the field where the new police

officer must demonstrate his capabilities. If he fails to perform as expected, was a lack of training the cause? No one will know unless field performance can be correlated with training information. Only in this way can training needs be established with any degree of reliability.

Academy staff will input a great deal of information to TMS files while recruits are still in training, or attending refresher training. But in order to continue input of personnel information throughout the trainee's career, a secondary network of four TMS terminals is to be placed at Personnel Division in the near future. Data will be added to TMS files from Personnel Division in order to permit continuous observation and evaluation of our police officers after they have completed Academy training.

The link to TMS from Personnel Division is critical. The capability to continuously monitor each officer's field proficiency will enhance TMS by providing needed feedback and new career development information. A design study is currently underway to determine the advisability of enlarging TMS to incorporate even more personnel data.

BENEFITS OF THE COMPUTERIZED SYSTEM

Some of the system's anticipated benefits were described earlier in this report. Since the Department has just begun to operate TMS, it is too early to conduct a fully detailed and comprehensive analysis of the system's value and effectiveness. However, the contractor who designed TMS also prepared an estimate of the potential man-hour savings which could be realized by implementing the system. The contractor's report concluded that automating the functions currently performed manually would result in a minimum

savings of nearly six hundred man-hours per month. Time saved as a result of the system's capabilities will then be free for more productive interaction in the instructional process. At this time, it does not appear feasible to reduce personnel deployment at Training Division, even though the system will significantly minimize much of the clerical workload associated with administering training, since the anticipated man-hour savings will be distributed over a diverse staff of approximately 75 employees.

COST SAVINGS FROM SIMILAR SYSTEMS IN OTHER ORGANIZATIONS

Cost savings realized by comparable organizations as a result of implementing similar computerized systems have been significant. For example, the clerical effort required to revise a course and all associated course documents was reduced from 60 man-hours to less than 2 man-hours per course revision. Similarly, the time required to generate TPO-based evaluation questionnaires in order to conduct a performance evaluation of recent graduates was reduced from five days to approximately 15 minutes.

The training materials inventory and control function reduced the time required to project a 6 month inventory needs level from 12 hours to a half-hour.

NON-REMEDIABLE RECRUITS MAY BE IDENTIFIED EARLIER

The system offers a potential for cost savings by virtue of the fact that TMS will allow closer monitoring of each recruit's progress through the twenty-week recruit training program. This capability will make it possible to begin intensive remediation efforts immediately, if a recruit experiences difficulty in training.

In this way, TMS is expected to be of considerable assistance in addressing the Department's affirmative action goals. As a result of the intensive evaluation and validation efforts TMS will allow the Department administrators to isolate those portions of the instructional process with which each recruit, particularly the minority recruit, experiences proportionately greater difficulty. Corrective steps can then be taken to eliminate these problems from the curriculum, and provide compensatory assistance to recruits as needed. This should help further reduce the recruit attrition rate and to produce a better trained police officer.

Conversely, some savings should be realized as a result of the fact that those recruits who do not respond to remediation will be identified, and terminated, at an earlier point than is currently possible. Since monies expended to train recruits essentially represents an investment, it is cost-effective to identify and terminate those recruits who cannot be remediated as early as possible. If the average termination point for recruit academic failure can be reduced from the current average point by two weeks, for example, the City will realize approximately $50,000 in salary savings over a one-year period.

SPECIALIZED RESEARCH PROJECTS

A task force which recently concluded, further illustrates TMS' potential value to the Department. A major lawsuit was recently filed against the City by a former Department employee on charges of promotional discrimination. In order to prepare the City Attorney to defend the City against this case, the Department conducted extensive research on the correlation of the Department's physical hiring standards to the incidence of on-duty physical injuries, as

well as to performance both in the Academy and after graduation. Approximately ten man-years, or nearly 21,000 man-hours have been expended to date on this task of manually gathering the needed data.

If TMS had been in operation for a sufficient period of time to build an adequate data base, the needed statistical data could have been provided by the computerized system at an estimate of less than one-tenth the cost in man-hours.

SUMMARY AND CONCLUSION

TMS is designed to constitute a more effective method of managing the training process for all sworn and civilian personnel.

In summary, the system's computer capabilities will save many laborious hours previously expended in managing the training process. The system will significantly reduce paperwork burdens, provide a superior quality control mechanism, and supply managers with needed information on a more timely basis.